American Druggist

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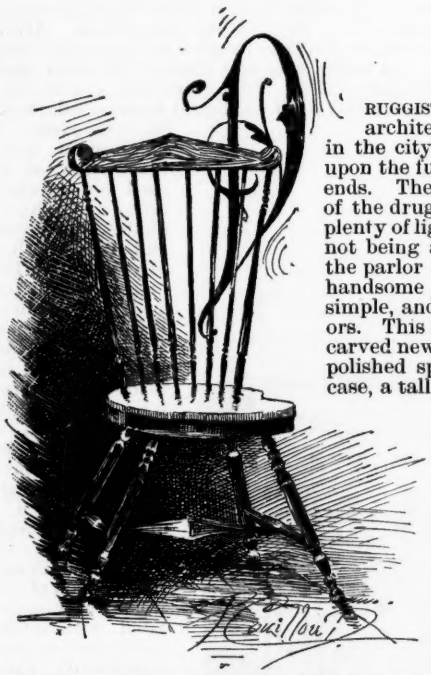
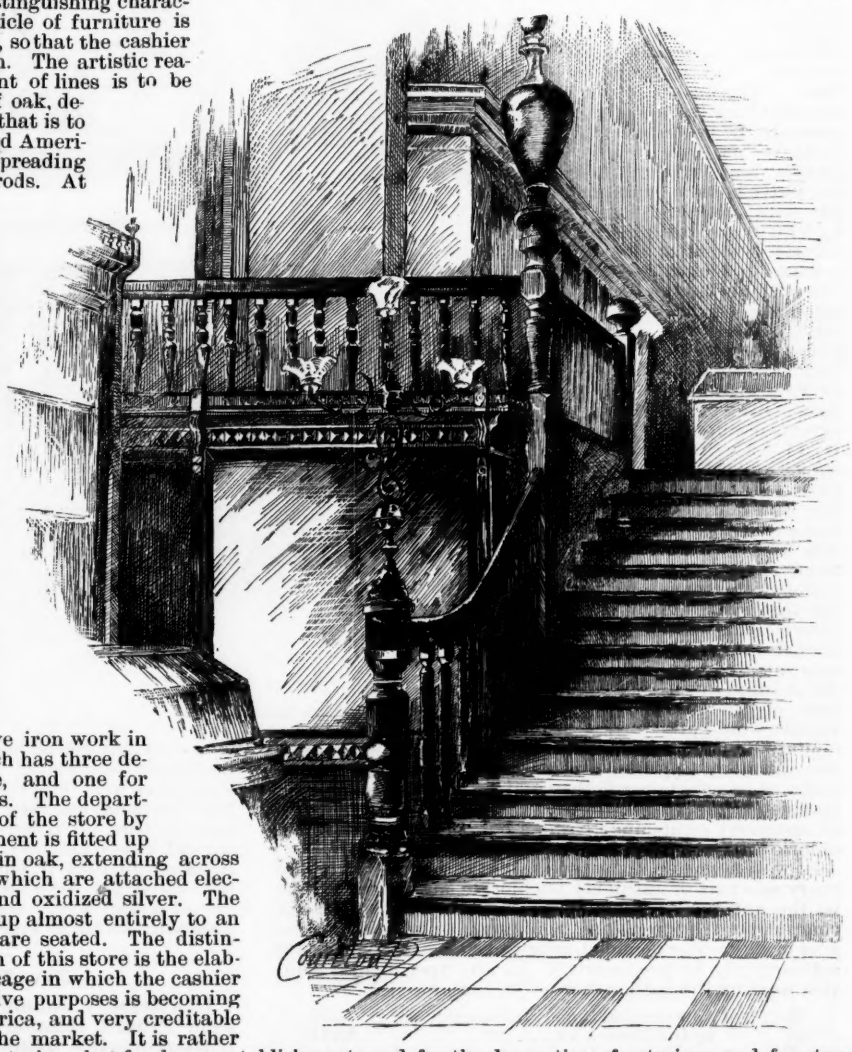


DRUGSTORE ARCHITECTURE AND DECORATION.

DRUGGISTS are gradually learning the value of simplicity and compactness in the architectural arrangement and decoration of their stores. There is one new store in the city of New York which presents a beautiful effect of interior architecture based upon the fundamental idea of necessity and of adaptability of given conditions to desired ends. The building was originally a corner dwelling-house, and the previous occupant of the drugstore was a picture dealer, who, of course, required a street frontage with plenty of light. The druggist needed more space, and the basement on the side street not being available, on account of its occupancy by other places of business, he took the parlor floor of the house and connected it with the ground floor of the store by a handsome oaken stair, curving outward. From the street the effect is solid, rich, simple, and at the same time picturesque, suggesting baronial halls and ancient manors. This staircase is about six feet wide, and terminates on either side in handsomely carved newel posts, on top of which stand brass gas fixtures designed in wrought and polished spheres, and twisted rods with fluted glass shades. On the top of the staircase, a tall colored jar rises on either side. The whole arrangement of this staircase is very artistic. The wall fittings of the retail department are throughout in oak, handsomely carved in small oak leaf and acorn patterns. A decorative idea worthy of attention is found in the use of slender, fluted Ionic columns wherever they are needed to separate the compartments of the casings, and also on either side of the elaborately carved mirror frame at the right, entering from the street. In the store previously occupied by the druggist, iron Ionic columns formed part of the scheme of architectural decoration, and, in moving into a new store, he has preserved the memory of the old by basing his scheme of decoration on the Ionic columns. The wall cupboard, on the left side as one enters, is half-covered with mirrors which, in their handsome oak settings, produce an admirable effect. The many oak drawers have small oxidized silver handles wrought in tasteful designs. They are numbered instead of being labelled. The cashier's desk is a very effective piece of furniture, simple, compact, and in excellent taste. It is in oak, with relief carvings. The distinguishing characteristic of this well-designed article of furniture is the effect of a tall, slender railing, so that the cashier sits, as it were, in a fenced-in pen. The artistic reason for this striking arrangement of lines is to be found in the chairs, which are of oak, designed in old Colonial fashion; that is to say, they are of the old-fashioned American kitchen chair order, with spreading backs composed of tall, slender rods. At the left on entering, in the angle formed by the junction of the front and side windows, stands an oaken sponge case, adorned with a judicious amount of carving, and, with the masses of yellow sponges seen through the glass sides, it presents a nice effect of color and form. The counters and the pavement are in white marble. What architectural frontage is needed at this store is of black, composite columns with Corinthian pilasters picked out in gold.



The dispensing department, on the second floor, reached by the staircase, is large and conveniently arranged, with the prescription counter extending across the head of the staircase a few feet back, and the manufacturing counter running parallel with it. The laboratory is in the cellar basement, four feet of space having been gained by raising the floor of the store.

A good use is made of decorative iron work in a large New York drugstore which has three departments—a retail, a wholesale, and one for chemicals and chemical apparatus. The departments are united at the front of the store by oaken gates. The retail department is fitted up in oak, with four showcases, also in oak, extending across the store. The gas fixtures, to which are attached electric lights, are in pale bronze and oxidized silver. The wholesale department is given up almost entirely to an enormous desk at which clerks are seated. The distinguishing feature of the decoration of this store is the elaborate and striking wrought iron cage in which the cashier sits. The use of iron for decorative purposes is becoming more and more frequent in America, and very creditable work in this material is now in the market. It is rather too heavy in its effect for small interiors, but for large establishments and for the decoration of exteriors, and for store fronts generally, it may be used to advantage. Combined with natural woods and treated in delicate forms, it lends itself admirably to decorative purposes. The interiors of the new New York drugstores are, as a whole, very much better, artistically, than the exteriors are architecturally. The reason is, doubtless, that the fittings show the influence of the modern art movement, while the exteriors, representing a greater sum of money in the form of outlay, have not yet come under the jurisdiction of those architects who work according to progressive American methods.

(To be continued.)

Color Reactions of Certain Ethereal Oils.

Oil of peppermint, mixed with alcohol and a little powdered sugar, assumes a bluish-green color when heated with dilute hydrochloric or sulphuric acid. Menthol which is contained in this oil does not give the reaction. Phloroglucinol is a very delicate reagent for those ethereal oils which contain eugenol. Thus *oil of clove*, which consists of eugenol and a sesquiterpene, $C_{15}H_{24}$, gives a bright red color when treated with alcoholic phloroglucinol and concentrated hydrochloric acid. Resorcinol employed in the same manner causes a red-violet coloration, and pyrogallol a violet one. *Oil of cinnamon* (cassia oil) treated as above with phloroglucinol gives a deep red color, and with resorcinol a cinnabar red. *Oil of pimento* is colored pink by phloroglucinol and dirty violet by resorcinol in alcoholic solutions and with addition of hydrochloric acid. The three last-named ethereal oils, when mixed with alcoholic aniline sulphate and dilute hydrochloric acid, assume a yellow color, especially on boiling. It is probable that this reaction is due to eugenol contained in these oils.—A. IHL. Abstract from *Chem. Zeit.*, 13, 264, in *J. S. Chem. Ind.*

Note by Ed. Am. Drugg.—The chemicals mentioned in this note, ending in *ol*, are thus named by some chemical writers, in order to show that they belong to one class of bodies. Otherwise the substances are known as "phloroglucin," "resorcin," and "pyrogallic acid."

Method of Separating Arsenic from Antimony.

O. KOEHLER communicates in the *Arch. d. Pharm.* (May, 1889, 406) a method of quantitatively separating arsenic from antimony, which is based upon, but is an improvement of, one mentioned by Rose. The latter directed that both elements be precipitated as sulphides, and that the latter be treated with concentrated hydrochloric acid at a gentle heat, whereby antimony sulphide is dissolved, while sulphide of arsenic is not. It has, however, been shown that a little of the arsenical sulphide is always dissolved under these circumstances. The question now arose whether it was not possible to effect the separation in this manner that hydrosulphuric acid, when passed into a hot concentrated hydrochloric solution of the two metals, would precipitate all the sulphide of arsenic before throwing down the antimony sulphide. In other words, the author's object was to ascertain whether hydrosulphuric acid would completely precipitate arsenious acid as As_2S_3, in presence of antimony compounds, from a hot concentrated hydrochloric solution.

Cashier's Desk.

It was ascertained by special experiments that for every one part of antimony trichloride (supposing this to be the antimony compound present) at least two parts of concentrated hydrochloric acid must be added. If less acid or any water is added, some antimony sulphide would subsequently be precipitated. In an experimental solution used by the author there were contained:

20 C.c. of solution of antimony trichloride..sp. gr. 1.330
45 " " hydrochloric acid..... " " 1.124
5 " " a solution of 1 Gm. of arsenious acid in 1 liter of water.

This mixture was heated to near boiling and a current of hydrosulphuric acid passed through it until the gas was in excess even after shaking the mixture. The separated arsenic sulphide was now collected on a filter moistened with hydrochloric acid (to prevent separation of antimony sulphide), and the precipitate washed with a mixture of hydrochloric acid (one part) and water (three parts) until a drop of the wash-water, when dropped into a solution of hydrosulphuric acid, no longer caused a red tint, showing that all traces of antimony chloride had been washed out of the filter.

The filter, together with the arsenic sulphide, was now put into a beaker and treated with bromine water, so as to completely reach every part of the precipitate. After macerating some time, all the arsenic was converted into arsenic acid. The whole was now filtered, the filter and contents thoroughly washed with ammonia, and finally enough ammonia added until the liquid became colorless. Next an excess of magnesium mixture (such as is used for precipitating phosphates, etc.) was added, and the mixture, after being stirred, set aside for 24 hours. During this time all the arsenic acid separated in form of ammonio-magnesium arsenate. This was collected upon a filter—previously washed, dried at 103° C., and tared — and washed with dilute ammonia until a portion of the wash-water acidulated with nitric acid ceased to give a turbidity with nitrate of silver. Finally it was dried in a hot-air bath at 102°–104° C. to constant weight. In this condition the precipitate has the composition $2(NH_4MgAsO_4).H_2O$.

The analytical data quoted by the author show that the method is quite satisfactory.

Historical Note on Antimony.

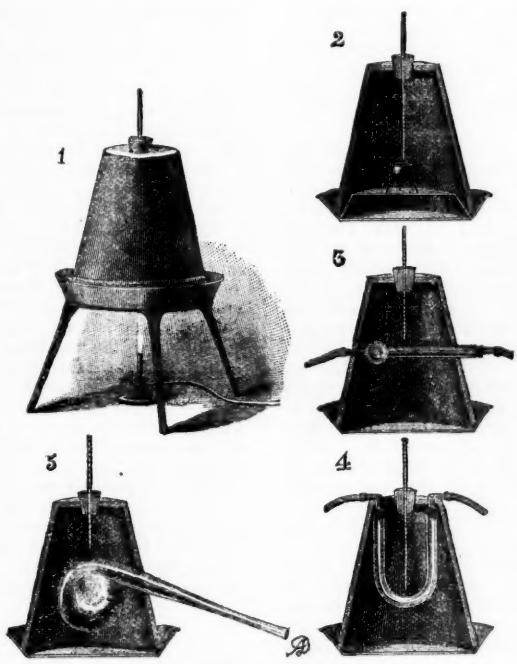
As a supplement to the interesting paper by Prof. James F. Babcock in our last November number (page 202: "Historical Notes on Antimony and its Principal Combinations"), and to the notes appended to it by the editors of this journal, we desire to announce that metallic antimony has indeed been known to the ancients, at least in Eastern countries. Recent discoveries in the trans-Caucasian and Babylonic-Assyrian regions have shown that the metal has been used, in very olden times, for the manufacture of vessels, ornaments, and other objects. An old vessel exhumed at Tello (southern Babylonia) is reported to consist entirely of antimony. Virchow believes that the supposed tin objects formerly found there are also antimony, since tin ore does not occur in the Caucasus, so far as known.

New Test for Thymol.

To a solution containing thymol, some drops of potassium hydrate solution are added, and so much iodized potassium iodide solution that the solution becomes yellow, thus containing only a little free iodine. A beautiful red color is obtained on gently warming; this gradually becomes more intense, but disappears after a time or on warming more strongly. The test detects about 1 : 20,000 of thymol in water. Other phenols examined did not give this coloration.—*L. v. Italie in Arch. d. Pharm.; J. Chem. Soc.*

A SIMPLE HOT-AIR BATH.

MR. T. O'CONOR SLOANE, Ph.D., who has suggested many ingenious devices for adapting simple articles to laboratory use in such a manner as to dispense with the need for more elaborate and expensive appliances, describes in the *Scientific American* of June 1st a very efficient hot-air bath for laboratory use, in which an ordinary flower-pot is the essential feature. An inverted flower-pot is placed on a tin pan or sand-bath, and this, in turn, is supported by a tripod or retort stand over a Bunsen burner (or kerosene stove). The usual aperture in the bottom of the pot serves for the insertion of a perforated cork through which a thermometer is passed. As the sand-bath directly over the burner becomes very hot, it is advisable to invert a second smaller pan within the first, as shown in Fig. 2, to prevent too direct a radiation of heat from the hot metal. Upon the latter the little stand or bent triangle, supporting the crucible or watch-glass containing the substance to be heated, may be placed. The bulb of the thermometer should be near the substance to be dried, to insure a correct indication of temperature. To place a vessel in the chamber or remove it, the pot must be lifted from the sand-bath. The porous nature of the pot not only provides for some ventilation, but also serves to absorb the vapors given off during the process. To adapt the pot for use with drying tubes or retorts, its walls can easily be perforated to admit of such arrangements as are shown in other figures. It conduces greatly to the maintenance of an even temperature to use the second inverted bath. A hint may also be taken from the former custom of employing a heavy drying plate. If for the light metal pans a plate ¼ inch or more in thickness be substituted, the temperature will not be subject to as rapid variations. The tray furnished with the next largest size of flower-pot may be used instead of the sand-bath, and gives an absolutely non-corrodible construction. While the bath is in use for drying substances in its interior, its top, which has a rather low heat, affords an excellent place for drying precipitates wrapped in their filtering paper. It is generally just hot enough to dry them with reasonable quickness without danger of spurting, and it also acts, by its capillarity, to absorb the water directly.



Sloane's Hot-Air Bath.

Detection of Mercury.

THE test employed is the converse of Nessler's ammonia test. If a mercuric chloride solution is treated with potassium iodide until the solution again becomes clear, then with sodium hydroxide, and finally with a few drops of ammonium chloride solution, a yellow or brown turbidity arises according to the amount of mercury present. The limit of the test for mercuric chloride is about 1: 31,000, whilst the stannous chloride test has a limit of about 1: 40,000 to 50,000. The former test may, however, on account of its characteristic *color*, very well supplement the latter. The test can be applied to blood, urine, and other organic substances after oxidizing with hydrochloric acid and potassium chlorate.—J. KLEIN, in *Arch. d. Pharm.* and *J. Chem. Soc.*

Detection of Cotton-Seed Oil in Olive Oil.

E. HIRSCHSOHN and J. BIEL recommend the following method in the *Pharm. Zeitsch. f. Russl.* (27, 723): 3 to 5 C.c. of the oil to be tested are placed in a test tube with 6 to 10 drops of a solution of 1 Gm. of crystallized gold chloride in 200 C.c. of chloroform ; the tube is placed in boiling water and heated for 20 minutes ; no red coloration should appear. Experiments made with the following oils showed that they were indifferent to gold chloride under the above conditions: earth-nut, hempseed, linseed, poppy-seed, almond-kernel, mustard-seed, sesame and sunflower-seed, and wine-lees. Cotton-seed oil alone was found to take a coloration, rose red at first, passing to cherry red. On the other hand, cotton-seed oil is not detected equally well when mixed with other oils ; the test does not succeed at all in drying oils; it succeeds very well in earth-nut, sesame-seed, almond-kernel oils, etc., and best of all in olive oil, even 1 per cent showing a raspberry-red color in 20 minutes.

According to J. Biel (*Pharm. Zeit.*), 5 per cent of cotton-seed oil in lard can be detected with certainty by gold chloride.—*J. Chem. Soc.*

On Bitterwaters.*

BY ENNO SANDER, PH.D.

ON a cold day last winter, I observed in my laboratory a considerable deposit in a bottle containing a ten-per-cent solution of sodium sulphate, while a bottle of "Rubinat Condal" next to it had retained its limpidity, although, according to the analysis on its label, it contains 9.323 per cent sodium sulphate and so much of other salts as to increase its solid ingredients to a fraction over ten per cent. Thinking that an accidental disturbance to the sodium sulphate bottle might have caused the deposition of the crystals, I tried to produce the same effect in the Rubinat by shaking it, but could not change its appearance in the slightest degree. After the determination of its specific gravity (which amounted to but 1.038, and indicated a solution of anhydrous sodium sulphate of only 4.3 per cent), I came to the conclusion that this and other waters might need an examination, which was given, and I now offer the result of my investigation of some bitterwaters in this paper.

The name "bitterwater" has been adopted from the German, and is given to those strongly purgative waters which are impregnated with a large quantity of solid ingredients, composed, more especially, of alkaline and earthy sulphates. The latter are accompanied occasionally by alkaline chlorides, but seldom by carbonic salts and free carbon dioxide. The presence of hydrogen sulphide is generally caused by a reduction of their sulphuric salts in contact with organic matter, which latter is either an original part of the composition of the water, or an accidental addition to the contents of the bottle caused by careless cleaning. The coexistence of calcium and magnesium sulphate in these waters led Mitscherlich to attribute their presence to a double decomposition of calcium sulphate and magnesium carbonate, while others explain it by the action of decomposing pyrites upon talcose slates or other silicates containing magnesium. Thus have been formed in various places layers of salty crystalline masses, and not long ago I received from the northern part of Arkansas an amorphous mass of salty appearance and bitter taste, which, after being dissolved in hot water and filtered, yielded from the first crystallization a considerable quantity of pure magnesium sulphate. It was accompanied by gypsum, iron, and silica, and no doubt strong bitterwater could have been obtained there if it had been dug for.

Bitterwaters also frequently occur in beds of marl which have been formed by the decomposition of rocks containing the elements necessary for the production of these waters, through the agency of atmospheric precipitations, which, penetrating into the soil, absorb its soluble substances. Such waters are consequently dependent upon atmospheric influences, and demonstrate it by the inconstancy of both their ingredients and their temperature. To this special class belong those waters procured from wells sunk into the ground, as, for instance, those near Buda-Pesth and in the northern part of Bohemia.

Bitterwaters are limpid and devoid of color, the latter rarely reaching a pale amber. Their salty, bitter taste sticks to the tongue, and makes them very disagreeable and nauseous to the taste—qualities intensified by the absence of carbon dioxide.

There are many bitter springs and wells mentioned in the "Mineral Springs of the United States" (Bulletin of the U. S. Geological Survey, by A. C. Peale, M.D.), but the composition, especially of those containing a minimum of from 50 to 100 grains of sulphate salts, is known of but a comparatively small number. They are distributed all over the country, but the fame of few has reached beyond their own neighborhoods, and, as far as my knowledge goes, none are used commercially like those European purgative waters so highly recommended by our secular and professional press.

The "Rubinat Condal," a Spanish purgative water, referred to in the outset of this paper, claims 100.56 parts of solid ingredients in 1,000 parts of water, almost all of which are sulphates, and with this array of figures proclaims that "this water is superior to any other water of the same kind in Spain or Europe."

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* Paper read at the annual meeting of the Am. Pharm. Assoc. at San Francisco.

It has long been the universal custom among chemists to calculate in their anhydrous state the solid ingredients or saline contents of any substance of which an analysis is made, and, when for any reason this rule is violated and the crystalline form of a salt is reported, to mention the exact combination of the salt and water which go to make up the crystals so reported—a proceeding rendered necessary by the fact that some salts combine with varying equivalents of water, according to their different forms of crystallization. It must, therefore, be surmised that Dr. Canudas, of Salada, knew of this established custom when he rendered his report of the analysis of Rubinat Condal, and that every physician, pharmacist, and chemist—in short, everybody who is acquainted with the rules of chemical analysis—has presumed that the sodium sulphate and magnesium sulphate, both ingredients of the Rubinat Condal, were calculated in the analysis as anhydrous salts.

As mentioned before, the specific gravity of Rubinat Condal is 1.038, but, as its analysis claims over ten per cent of solid contents (of which 9.64 consists of magnesium and sodium sulphates), its specific gravity ought to approximate that of a ten-per-cent solution of anhydrous sodium sulphate, or 1.092 (Storer's "Dictionary of Solubilities," p. 627). A specific gravity of 1.038 corresponds to a solution containing 4.3 per cent of sodium sulphate, and to 9.75 per cent of Glauber's salt (ibid.), and the evaporation of 100 cubic centimeters of Rubinat, which were taken from a bottle at a temperature of 60° F., yielded a residue of 4.531 Gm. of solid ingredients, which corresponds almost precisely with the formula of the analysis, provided the water of crystallization be deducted from the figures expressing the quantities of the sulphate of sodium, magnesium, and calcium. The determination of the sulphuric acid confirmed this statement. Whether this water comes from a spring or a well, or is simply a filtered and bottled solution of a crude Glauber's salt, I have not been able to ascertain.

The "Natural Bitterwater of Friedrichshall" is obtained from a spring in Germany which was known and used for manufacturing common salt as early as the twelfth century, and for Epsom and Glauber's salts since the last century. It occurs in a bed of marl formed with sandstone, gypsum, and dolomite belonging to the Keuper system. In former years, a bitterwater was bottled at the spring which was produced by mixing the water from the old, weaker spring with that of a new and stronger artesian well, in such proportion as to give it a specific gravity of 1.022, and it was introduced by Dr. Bartenstein in 1842. The analysis of Justus von Liebig, in 1847, by whom it was strongly recommended, increased its popularity, although it had to share it with the Kissingen Bitterwater, the production of which in almost identical proportions was also recommended by Liebig. They both contain 25.294 parts of solid ingredients in 1,000 parts of water (Dr. O. Dirufsen, in *Balneotherapie*, 1876, pp. 144–146).

A stronger water than this must have been bottled previous to 1885, for the analysis of a sample taken from J. F. Heyl & Co. in Berlin at that time showed 35.938 parts, while the water claimed to be taken from the artesian well personally by Prof. Dr. Oscar Liebreich in 1885 is the strongest and contains 61.396 parts of solids in 1,000 parts of water (*Zeitschrift für Mineralwasser-Fabrikation*, January, 1886, p. 249). Since that time this strength has been kept up. I have obtained a similar sum total from my evaporations with a specific gravity of 1.042.

The marl beds of northern Bohemia consist of decomposed basalt and limestone, gypsum, and carbonate of lime. Near the villages of Pullna, Saidschutz, and Seidlitz, some forty or fifty wells have been sunk into the marl. They have a depth of about ten feet, and serve as receptacles for the atmospheric water which filters through the strata and in so doing take up the whole soluble constituents. For this reason there is a variation in the results of analyses of these waters which have been made at different times. Pullna contains 32.72, Saidschutz but 23.21, and Seidlitz only 16.4 parts of solids in 1,000 parts of water. The latter spring is noteworthy from having given its name to the well-known and popular seidlitz powders, although they do not contain any of its ingredients. The use of these waters has become limited, and their importation has almost entirely ceased.

Where the bitterwaters of Buda-Pesth, the various Hunyadis, Stephans, Victorias, Rakoczys, and some thirty more, are competing now in a hot struggle for ultimate superiority, there was but a large pond forty years ago, on the banks of which crystals of sodium sulphate were frequently found. The plateau on which this pond existed was drained within the next ten years and the Kelenfold cultivated with great success. Wells then became a necessity, and on digging the first, in 1863, a water of salty and bitter taste was obtained, which on trial promptly manifested its superior medicinal properties. More wells were soon in order, and all that have been dug have produced waters of similar medicinal value. Although the strength and quantity of these waters depend upon conditions similar to those explained above, it seems that they are not subject to irregularities in the amount of their solid ingredients as are other waters of the same class—a fact perhaps principally due to the imperviousness of the underlying strata. These wells have a depth of from fifteen to twenty feet, and yield more or less water according to the season. That their constancy, especially that of the Hunyadi Janos, was maintained for a long time, was shown by the similarity of four analyses, made by as many different chemists, during the period from 1863 to 1870. Their temperature, however, was not so uniform, and, according to the season, ranged from 45° F. in March to 56° F. in September (Valentiner, *Balneotherapie*, 1876, p. 148).

This constancy of the solids has not been so well maintained during later years. While Liebig's analysis in 1870 gave the sum total of solid ingredients as 35.055, R. W. Bunsen found an increase of about 10 per cent in 1876, or 38.626 parts in 1,000. Whether this increase was due to natural causes or to certain manipulations of the proprietor, Mr. A. Saxlehner, may be a difficult question to decide, but it cannot be denied that he was accused in 1877 by some former employees of having tampered with the different wells, mixed their outputs, and attached to the bottles, which had been filled indiscriminately from this mixture, the label bearing the analysis of J. v. Liebig for well No. 3. There are strict laws in Austria against such proceedings, which are rigidly enforced. Information in the form of affidavits to the foregoing effect reached the authorities, and the analysis of J. v. Liebig, which used to grace the bottles with its bright scarlet letters, has since disappeared from the labels of Andreas Saxlehner's Hunyadi Janos mineral water. Meanwhile its solid contents seem to be still increasing; at least the last bottle that I examined contained water with 42.59 parts of solids in 1,000, and had a specific gravity of 1.033.

The use of bitterwaters by persons who lead a sedentary life, and do not care to give up the pleasures of the table, has become almost universal; but the taste of these waters is abominable and nauseating. However, Prof. Dr. R. Fresenius, the eminent chemist, in his opinion on Hunyadi Janos, has given a valuable hint in this direction. He says: "Although its contents, of free and half-combined carbon dioxide, as in all bitterwaters, are not large in themselves, they are not insignificant, and no doubt have a beneficial influence upon its taste."

Every one who has ever taken Hunyadi Janos knows that its taste is still far from pleasant, but the thought suggests itself that, if a small amount of carbon dioxide be of such benefit, how much more influential in this respect would a thorough carbonization be? There are very few pharmacists who have not had some disagreeable experience in the handling of imported bitterwaters on account of deposits and rank odor—a fact which had induced some sagacious dealers to ask permission to draw the cork before delivering the bottle. All such inconveniences could be easily avoided by the recommendation and sale of carbonated artificial bitterwaters, which, by their correctness, freshness, and comparatively fair taste, would quickly supersede the nauseating imported stuff.

And it should be borne in mind that carbon dioxide is acknowledged to be an active tonic for digestive organs, and that bitterwaters impregnated with it will tonify and strengthen the intestines, while without its aid their prolonged use will weaken and prostrate them.

Thiocamf, or Sulphurized Camphor.

Dr. Emerson Reynolds has published an extremely laudatory notice of a new disinfectant named "thiocamf," the basis of which is said to be a liquid that is formed when sulphur dioxide is brought into contact with camphor (*Chem. News*, June 22d, p. 291). It appears that although sulphurous acid gas alone requires a pressure of at least two atmospheres for its liquefaction, contact with camphor effects the liquefaction at once without any pressure. Some little mystery is preserved about other bactericides that are introduced, but, as the preparation is to become the subject of a patent, this is perhaps explicable. The principal feature, however, seems to be that whereas the liquid can be kept in bottles without pressure at an average temperature, the mere exposure of it in a thin layer to the air determines the steady evolution of relatively enormous volumes of sulphurous acid gas.—*Pharm. Journ.*

The Conversion of Oleic into Stearic Acid.

By heating oleic acid with 1 per cent of iodine in sealed tubes to 270°–280°, a mixture of fatty bodies results, containing 70 per cent of stearic acid. This fatty acid can be separated by melting the contents of the tubes with tallow soap, boiling with acidulated water, and then distilling with superheated steam. One-third of the iodine is obtained as hydriodic acid in the resulting liquids, but the remainder is difficult to recover, being retained in the tarry residue formed. Bromine acts similarly, yielding a solid acid melting at 51.5°, whilst with chlorine an acid melting at 31.5° results. The addition of colophony facilitates the reaction in each case. It is suggested that the unsaturated oleic acid first takes up iodine, that then hydriodic acid is given off, and this acts upon the oleic acid with the formation of stearic acid and regeneration of iodine.—P. de Wilde and A. Reychler in *Bull. Soc. Chem.* (*J. Soc. Chem. Ind.*).

IMPROVEMENT IN HOT-AIR BATHS.

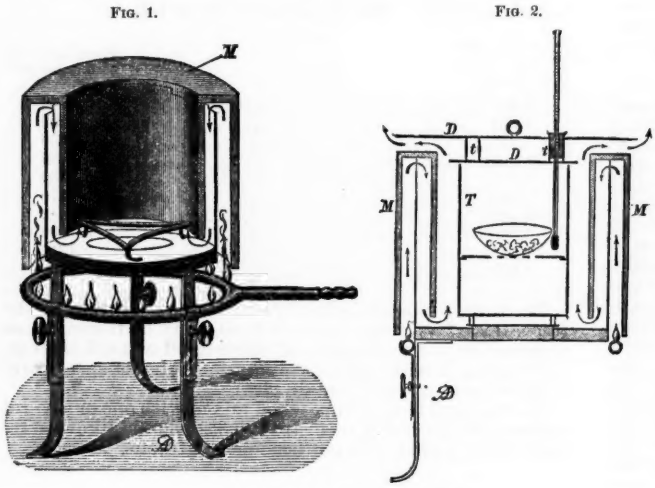
PROF. LOTHER MEYER has made some improvements in the hot-air baths which he recommended some six years ago (see our abstract in NEW REM., 1883, 235). He now prefers to make the outer mantle (see cut), M, of clay instead of copper. The frame which carries the mantle is of iron. The bottom is a double one, and there is an opening in it which may be closed by a cover. The heating is done by means of a coil of pipe, having the burners arranged in a circle. If the bath is to be used for heating retorts, flasks, etc., the latter are simply placed on a triangle inside. Since the vessels do not come in contact with the flame, and are heated throughout very uniformly, there is but little danger of charring the contents or of breaking the vessels.

If the bath is to serve as a drying chamber, a separate vessel, T, of copper or porcelain (see Fig. 2), is placed inside. The substance to be dried is placed in this and the double-walled cover D on top of it. The latter has two tubulures, one for the thermometer, and the other for allowing the escape of gases, etc.

By modifying the form of the cover, flasks may be placed within the chamber so that the neck of the flask may still project beyond the cover.

All forms of hot-air baths, constructed after the plan of those here described, must be so constructed that the channels through which the hot air passes are of the proper proportion, in comparison with the amount of heat produced by the burner. For instance, if the gas burns from small orifices of 2 or 3 millimeters in diameter, then the walls of the channels should not be more than 10 millimeters distant from each other, because otherwise there will be too great a loss of heat.—After *Berichte*, 1889, 879.

FIG. 1. FIG. 2.



Lother Meyer's Hot-Air Bath.

AN IMPROVED KEROSENE BURNER.

THE kerosene burner here illustrated has many advantages over those heretofore put on the market.

In the first place, the reservoir is separate from the burner or stove, and is hermetically closed, which prevents both leakage and accidents from ignition of the liquid. The vapor of the burning kerosene becomes mixed with a proper proportion of air, whereby the flame is rendered blue (non-luminous) and acquires the highest obtainable heat. As will be seen from the cut, the burner is placed horizontally, and is fed from below, the supply being regulated by an adjustment screw. Before using the apparatus, pressure is generated in the reservoir by means of the bulb attached by a tube to the inlet at the top.

The form shown in the cut represents only one of the methods of applying the principle. Other constructions are provided for heating boilers, stoves, etc. The chief depot is at Munich (A. v. Wurstemberger & Co., 16 Schwanthalerstrasse).

Kerosene Burner.

Marking-ink Pencils.

IN one of the patents applied for by Mr. J. Hickisson, it is stated that Congo red and benzo-purpurine are used in the manufacture of marking material. The coloring matter is made up into a plastic mass by admixture with suitable binders, such as albumen, borax, kaolin, and gum tragacanth. The mixture is moulded into sticks, which are imbedded in wood or fitted in a holder. The mordants used may be in solution or made up into tablets to be rubbed on the material. A mixture of two or more of the following compounds may be employed as the mordant: pyrogallic acid; sodium aluminate, arsenate, carbonate, chloride, etc.; sulphates of iron and copper; alum; borax; tannic acid, etc.—*Chem. and Drugg.*

A Pointer in Dispensing.*

BY S. F. HUGHES, PH.G., SAN FRANCISCO.

EVERY druggist appreciates the sense of embarrassment with which prescriptions applicable to delicate diseases are called for by the customer.

The ruby blush of the cheek too often tells the secret before the timid lips can speak it; the gaudy and fashionable attire may allure or amaze the layman, but the little scrap of paper handed to the clerk by the customer strips the latter of his spirit of nonchalant audacity and transforms him into a contrite creature, presenting his prescription, for which he richly pays, with an air of penitence intensified by an uncontrolled embarrassment of manner.

The writer was moved to these reflections a short time ago by a young man handing him a prescription as follows:

℞ Ung. Hydrargyri, ʒi.
Div. in chart. No. xx.
Sig. Use as directed.
DR. —— ——.

I determined to get out of the old way of preparing this prescription, and am happy to state that I was able to dispense it in one-third of the time heretofore required in the old process, by the adoption of the following method, which I can earnestly recommend to the use of the profession, it being very simple but quite practical.

I first lay the Ung. Hyd. on a pill-tile and roll it into a long roll, adding plenty of lycopodium to keep it from sticking to the fingers, and cut it into twenty parts, using a heated spatula to avoid adhering.

Each piece is then rolled into a marble shape by placing it in the palm of the hand and, as stated above, using lycopodium *ad libitum;* the waxed paper being laid out on the counter, each piece when finished was dropped on the paper without adhering in the least. I then folded each and dispensed as usual.

It may be said that lycopodium does not affect the absorption of the mercury in the least.

Fruit Syrups.

ONE of the recent numbers of Volume II. of the "Handbuch der praktischen Pharmacie," by Beckurts and Hirsch, from which important work we have several times given extracts, contains a very practical and instructive chapter on the preparation of fruit syrups, of which we give a translation in the following:

All fruit to be used for fruit syrup must be ripe, of good quality, freshly gathered, and worked up while fresh. If the fruit has been kept some time after being gathered, particularly when in large heaps [and of a soft or delicate structure], and at a warm temperature such as is likely to prevail at the time of ripening, it will often be found that fungi develop in the interior of the heap, and more frequently still that a fermentation sets in which is liable soon to pass into the acetous stage, thus rendering the juice unfit, at least for medicinal use. For this reason it is advisable to reduce the fruit at once to a pulp, care being taken, in the case of currants, that the seeds are separated as soon as possible from the pulp, and, in the case of cherries, that not only the pits are crushed, but also the seed-kernels contained therein properly comminuted. This is most conveniently done by passing them through the rollers of a mill. But where this is impracticable, the cherries may be put whole into a sack made of wide-meshed material, and subjected to a gradual and

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

strong pressure. The residuary cake is then pounded in a mortar. The crushed mass, together with the expressed juice, is now transferred to a rather high and narrow vessel, so as to fill it to about two-thirds of its height, the vessel closed with a cover fitting snugly over the edge, and set aside in a place free from dust or vapors, at a temperature not exceeding 59° to 68° F. When large quantities are operated upon, it is best to use vessels provided with a faucet near the bottom, so as to permit the drawing off of most of the juice, after completed fermentation, without having to dip out the whole mass and put it under the press. The inner orifice of the faucet, to prevent its being stopped up, is covered with a coarse piece of woven material, straw, or other convenient substance.

According to the degree of ripeness of the fruit and the temperature, the fermentation of the juice may begin in a few hours or after 1, 2, or 3 days. In any case, the mass should be well stirred at intervals of 2 hours, the particles of fruit which float on top being pressed down into the juice which is at the bottom. If the stirring is neglected, the more exposed layers may easily develop fungi or run into acetous fermentation.

Even subsequently, when the access of air is retarded by carbonic acid gas forming a layer over the contents of the vessel, stirring must not be neglected. As fermentation proceeds, the dregs separate more and more from the liquid. The latter becomes more thin-fluid, the dregs assume a paler color, the mass previously swelled up by carbonic acid gas collapses more and more, and the development of gas becomes more feeble. This is the moment—particularly if the alcohol test mentioned below (near end) shows the process to be approximately completed—when the liquid must be separated from the solids. For this purpose, the liquid is allowed to drain off as much as possible, the dregs transferred to a sack of not too loose texture and subjected to a gradually increased pressure which should be finally maintained for some time. It is surprising how much juice will drain out if pressure is applied gradually and at intervals.

The fermented juice is at once transferred to bottles, carboys, or casks, which must be completely filled, loosely stoppered, and stored in a *cool* place (the cellar or other convenient locality). It will there undergo a secondary fermentation whereby it becomes partially clarified and more ready to pass through the filter. When freshly separated from the dregs, the juice still contains a large amount of fine particles in suspension, which would rapidly clog the filtering surface, for which reason it should be allowed to stand at rest a few days to settle. This is particularly the case with currants, strawberries, raspberries, and barberries, while the juice of buckthornberries, mulberries, and cherries becomes clear and filters more rapidly. Nevertheless, if the juice is to be clarified by settling alone (without filtration), several months are necessary. As long as the juice, in consequence of the secondary fermentation, contains an abundant quantity of carbonic acid in solution, it does not undergo any material change, nor does it lose color. But *after* the escape of the carbonic acid, even a perfectly clear (settled or filtered) juice becomes turbid within a few hours, loses part of its color, or even changes color. For this reason, the juice should be filtered when it has become moderately clear by standing, but while it still contains carbonic acid gas. The latter also preserves it, during filtration, against the injurious effects of atmospheric air.

In practice, the following method has been found particularly useful: Separate the *thin juice*, without disturbing it, by means of a siphon or faucet—but *not* by inclining the vessel and pouring it off—from the sediment. Stir or mix the latter by itself with the remainder of the liquid, and pour it at once upon a moistened paper filter provided with double points [that is, resting within a smaller filter, so as to render the point stronger], and fill the filter to about ½ or ⅔ of its height; then gradually pour on top the *thin* juice, and keep the filters as uniformly full as possible by frequent refilling. In this manner the filtrate will pass through clear from the very beginning, the filters do not become clogged so readily and remain in action usually during fully 24 hours, so as to yield, during this time, a quantity of filtrate corresponding to between 4 and 8 times their capacity, according to the nature of the juice. Besides, they will break only in rare cases. It is, of course, advisable to pour the clear filtrates together in intervals of a few hours [or less], so that, if a filter should break, not too large a quantity of clear filtrate would be rendered turbid again. It is not advantageous, as a rule, to keep the same filters in operation for more than 24 to 30 hours. It is preferable to squeeze them out on the second day and to replace them by new ones. Since the liquid gradually loses its carbonic acid gas while passing through the filter, and the air soon begins to affect it, it will not do to wait until *all* the liquid has passed the filter, but at certain intervals the clear filtrate collected up to that moment is mixed with the proper proportion of sugar [for every 35 parts of clear filtrate, 65 parts of sugar], and the whole raised to a boil. The proper way is to cause the sugar to dissolve *at a moderate heat*, assiduously stirring, then to remove the stirrer, and to heat quickly to boiling *without further stirring*. Usually there will thus be formed a comparatively high layer of foam, which, if the fire is properly regulated, collapses within 5 to 15 minutes to a small volume. During this time it materially aids in preventing too great a loss of liquid from the gently boiling syrup. If the heat is applied carelessly, the contents of the boiler easily boil over owing to the alcohol and gas contained therein. For this reason, it is advisable, in the case of large boilers, particularly those which are set in brickwork and cannot be lifted from the fire, to suspend a thermometer in the liquid, and to moderate the heat, or remove it altogether, when the temperature has risen to about 197° to 203° F., as the real boiling begins usually at 209°–210° F. [a little below the boiling point of water], and the hot brickwork usually radiates sufficient heat to bring the contents to a boil without fire. As soon as the liquid, after removal of the heat, has come to a rest, the scum is dipped off or pushed to one side, and the syrup passed through a moistened woollen filter, not too densely woven and not "felted." Utensils of tin or iron are to be avoided. Fruit juices are usually boiled in burnished copper kettles.

The *yield* of finished fruit syrup depends upon the degree of ripeness of the fruit, the proportion of sugar and water naturally existing in the latter, and the kind and quality of the fruits; 100 parts of stemless sour cherries yield about 150 to 200 parts of finished syrup. The yield, of course, depends greatly upon the proportion of sugar which is prescribed in the different pharmacopœias in which fruit syrups are officinal. Thus, for every 10 parts of clear juice, there are directed the following number of parts of sugar by the respective pharmacopœias:

15 (Greek).	18 (Russian and Swedish).
16 (Danish).	18.57 (German).
17.5 (Swiss).	

The French Pharmacopœia calculates the sugar upon the basis of the specific gravity of the filtered, more or less fermented juice. The proportions are as follows:

For every 1,000 parts of juice, of a spec. gravity (at 59° F.)	There are to be used... parts of sugar.
1.007	1746
1.014	1692
1.022	1638
1.029	1584
1.033	1530
1.044	1476
1.052	1442
1.060	1368
1.067	1314
1.075	1260

The proper moment when the first fermentation of the juice, mixed with the crushed fruit, may be regarded as terminated is ascertained by filtering off a small portion, and mixing it with half its volume of alcohol of spec. grav. 0.832, when it should remain clear.

The finished fruit syrup, when mixed with one or several volumes of alcohol of spec. grav. 0.832, should likewise remain clear and should not become gelatinous.

Oidtmann's Purgative.

Dr. Samuel Benton speaks highly of the use of Oidtmann's purgative as a remedy for habitual constipation, and states that the preparation contains :

Glycerin	3 i.
Lime Juice	3 ss.
Buckthorn Juice	3 ss.

with a diminutive quantity of alcohol and acetic acid (1 in 800). He has given the medicine an extensive trial, and has found it by micro-injection a most gentle and unirritating means of emptying the rectum.—*Chemist and Druggist.*

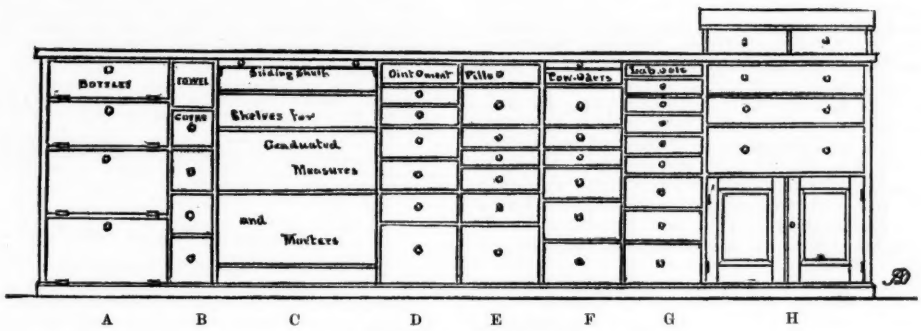
Florida Flower Farms.

A correspondent at Fort Meade, Florida, U. S. A., writes: Raising flowers for the manufacture of perfumery is an industry that is just getting a foothold in the South, and now it is claimed that attar of rose can be made in Florida with as much success as in the gardens of Bulgaria. The two varieties of roses grown are the musk and damask. On the southern slopes of the Blue Ridge Mountains, and in parts of Florida, these varieties flourish abundantly, and it is claimed that eighteen acres, well managed, will yield $40,000 per annum. The other flowers that are used for distillation, such as the jasmine, violets, lilies, and jonquils, are hardy here, and yield rich harvests of flowers to a generous cultivation. The only question of making the perfumer's art a leading industry in Florida is that of capital, and this seems to be furnished in the near future. A representative of a large Northern house has been prospecting around and experimenting with the flowers. He expressed himself as being well pleased with the success of his work, and a factory for the distillation of the flowers will shortly be erected somewhere in the South as a result of his visit.—*Chem. and Drugg.*

DISPENSING COUNTERS.

MR. C. S. HALLBERG, writing in the *Western Druggist*, says: "The prescription counter, or 'case,' as it is sometimes incorrectly termed, should be the most important piece of furniture in the pharmacy. As a fact, however, it is the most neglected; that is, the particular portion of it devoted to dispensing, the table proper. Many a pharmacy has a soda-water apparatus worth thousands of dollars, in which the prescription counter is scarcely fit to compound condition powders." He proceeds to give a design for a working table adapted to an ordinary dispensing business, upon which we have based the adjoining illustration. Owing to the omission of necessary measurements, our drawing differs from the original somewhat, but the one here shown is on the scale of 2 feet to 1 inch.

The design is for a 10-foot counter, 2 feet wide, recessed at the bottom, divided into five sections of 2 feet each.

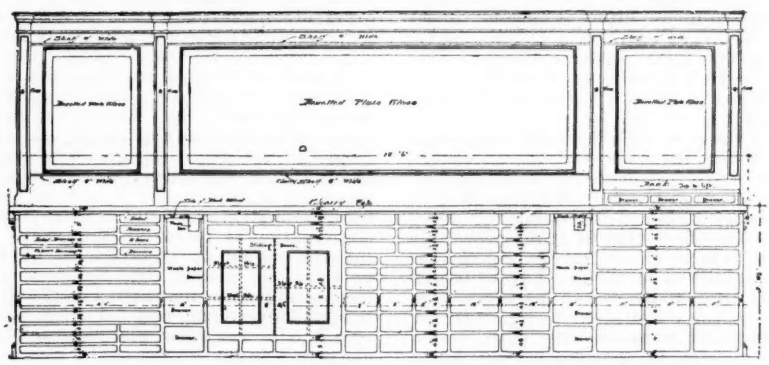


Hallberg's Dispensing Counter.

A. *Bottles.*—Four compartments consisting of lockers provided with hinged and spring doors similar to those on show cases. Each compartment is 18 inches wide and of heights to hold the following prescription vials, standing upright and corked, viz., ½ and 1 oz., 2 and 3 oz., 4, 6 and 8 oz. respectively. These lockers possess every advantage over drawers or ordinary closets; the vials are easily reached when wanted, and are not subject to jar or breakage. B. *Corks.*—Four cork drawers, 6 inches wide, of different heights, divided in the centre. The top space is empty for two towels. C. *Utensils.*—Two feet wide, consisting of three shelves with circular indentations to hold graduated measures by the foot (upside down). The first, below the counter, for minim and 1 oz. glasses, the next for 2 and 4 oz., the third for 6 and 8 oz., the fourth shelf for mortars, and the floor space for larger measures. Immediately under the top is a sliding shelf. D. *Ointments.*—Consisting of drawers, 12 inches wide, arranged for ointment slab, wax-paper, tinfoil, etc., and the lower drawers, in various depths, for ointment jars, boxes, etc., of different sizes. E. *Pills.*—Drawers 12 inches wide, the upper one for spatulas, next a deeper one for one or two pill machines and smaller; the remaining drawers for pill boxes (which should be stored on end to protect the labels). F. *Powders.*—Sliding shelf on top with a shallow drawer for capping-paper, etc., and a deep drawer with compartments for powder papers and gelatin capsules. The remaining drawers for powder boxes. G. *Labels.*—One top drawer for miscellaneous, and four with compartments for prescription labels. The remainder for homœopathic vials and miscellaneous articles, such as suppository and tablet machines. H. *Writing Division.*—Three drawers for stock labels, account boxes, etc., with a closet for storing prescription books. On this section is the desk, with two drawers for the day book, poison and liquor register, prescription blanks, etc.

The advantages of this arrangement are said by Mr. Hallberg to be that, proceeding to dispensing, the worker first procures the vial, if a liquid mixture, from the bottle division, and then a graduate and mortar from the utensil division, and, after having finished the mixture, the capping and labelling is done at the other end, making room for another operator to follow him closely. With two scales on the counter two dispensers can work without interference.

Four years ago we published, in connection with other pictures illustrating the beautiful store of Kelley & Durkee, of Boston, a design for a dispensing counter which had received a great deal of study, and was based upon many years of observation. We, therefore, reproduce it in this connection, feeling that its merits warrant special consideration. This counter is 3 feet wide and 15 feet long. It has a desk at each end, and next to each desk is a scale, one for fine and the other for coarse weighing. A long row of mortars, out of the way but in easy reach, extend from scale to scale. Over the mortars, and even with the lower edge of the large glass front, is a shelf for about fifty graduates; both mortars and graduates are placed upside down to avoid dust. Under the shelf a polished brass pipe, provided with five nipples and stopcocks, furnishes gas for Bunsen burners. Steam is introduced at one end of the counter and may be used when more desirable than gas. The space under the counter has been carefully divided into drawers and closets for empty bottles, pots, boxes, utensils, etc., etc., so as to bring the things in greatest demand in convenient reach. The arrangements for pasting are different from usual and warrant a word of notice. Tinned-copper paste holders are set in butternut boards which slide into the counters above the waste-paper drawers. The labels are placed directly on the boards, and the paste applied becomes so absorbent, after being washed and scraped several times a week, that a dry space on which to place a label may easily be found even when business is brisk. The paste brush is laid in a little trough cut in the board.



Dispensing Counter of Kelley & Durkee, Boston.

Assay of Coca Leaves.—Mr. V. D. Marck, as the result of numerous experiments (in *Ned. Tijdschr. v. Pharm.*), gives the following as a reliable process: Mix 50 Gm. of the powdered leaves with 20 Gm. of calcined magnesia, make into a paste with water, and dry at a temperature not exceeding 60° C. Then percolate with ether, and evaporate the percolate to dryness. Treat the residue with about 30 Gm. of two-per-cent hydrochloric acid, filter, and remove residual coloring matter by shaking with ether: then make the solution slightly alkaline with ammonia, and shake three times with 25 C.c. of ether; collect and dry carefully, finishing in the exsiccator. Ether is better than chloroform for extraction, as the latter requires a greater degree of heat for evaporation, and this is injurious to the cocaine.—After *Chem. and Drugg.*

What is the Effect of Heat and Moisture as a Preparatory Step in the Extraction of Some Drugs?*

BY J. U. LLOYD.

In considering the natural condition of vegetable organisms, we find that recent plants present in one respect a marked variation from the same substances after drying. The inherent moisture amounts invariably to a large part of their bulk, and the greater proportion of this water is lost by drying. (Note 1.)

Aside, however, from the decomposition products and dissociations produced by desiccation, there is involved a feature that should perhaps not be overlooked, one that I believe to be of considerable importance in some instances.

The succulent vegetable structure, in its natural condition, is readily permeated by an appropriate alcoholic menstruum; the cell tissues being expanded in the fresh drug, these integuments are open to the free passage of liquids. Indeed, there seems to be a decided endosmotic affinity for an alcoholic menstruum, which, therefore, permeates readily the water-relaxed integuments, even if the plant substance is in great slices. This fact is readily shown by placing a few slices of any fresh plant in alcohol, and observing the result. If it be a colored drug like bloodroot, the act of extraction or displacement can be readily seen, and it is shown that the vegetable tissue is very quickly permeated through and through, providing the alcohol is not too concentrated. It requires but a short period to realize the fact that in the natural condition such vegetable structures are easily extracted by alcoholic liquids. (Note 2.)

Many of these vegetable substances in drying become hard, brittle, and almost impenetrable to feasible menstruums. If the substance is exceptionally gummy or mucilaginous, alcohol may be then incapable of thoroughly extracting it, by reason of this impervious envelope of insoluble material, even though the desirable constituents of the drug are soluble in alcohol. Powdering the drug does not altogether obviate the difficulty, although it modifies it; and sometimes even a finely powdered drug of this nature is not capable of extraction with strong alcohol.

In my opinion, many tinctures and fluid extracts now made with mixtures of alcohol and water would be decidedly improved by the use of alcohol alone, were it capable of swelling and permeating the dried plant structure, thus reaching its inner recesses. Hence it is that, in order to satisfactorily extract a drug, we are often forced to bring the material into a condition approaching that of the natural drug, and add water to the alcohol to form a suitable menstruum. Even though alcohol alone is the best solvent for the purified active constituents of some drugs, I hold the opinion, as established in my experience, that to extract these same constituents from the drugs a hydro-alcoholic menstruum is often desirable. Perhaps this feature of the art of extraction has not heretofore been presented in this light; nevertheless it is evident from my experience that there is no other object in using dilute alcohol in many cases where it is certainly preferable to strong alcohol. (Note 3.)

Accepting, then, that water is often desirable as a simple *softener* of plant tissue, in order that the alcoholic menstruum may more easily permeate the substance of the plant material, the question arises, Is it always best to previously mix the water with the menstruum?

My experience is to the effect that in many cases the operation of percolation is more thoroughly conducted by a deviation from the established methods. I have found it preferable with some drugs to use water sparingly, in a preliminary step, even if the constituent to be extracted from the drug is altogether resinous. My plan, under these conditions, is to moisten the powder by sprinkling it with a small amount of water, from two to three ounces of water to the pound of drug being an average. This moistened powder is then permitted to remain in a closed container for ten or twelve hours, and is then moistened with alcohol, packed in the percolator in the usual manner, and extracted by the usual process. Where it is possible, after the water moistening and maceration, I prefer to use such an amount of alcohol to moisten the powder as will bring the combined amounts of alcohol and water in the drug to the strength of the alcohol that is used afterward to continue the percolation.

For example: If a mixture of two parts of water and three parts of alcohol is to be used as the menstruum, I moisten the drug first with two parts of water; next, after the maceration period has passed, with three parts of alcohol; then, after packing the powder in the percolator, I continue the percolation with a mixture of the same strength, water two parts, alcohol three parts.

If a precipitate in the produced liquid is always objectionable, which I do not now admit, change in menstruum is not desirable. (Note 4.) If the experience others may make in this direction corroborates my own researches, it will be found that the art of plant extraction may, in many cases, be modified in this manner with great advantage.

I would summarize as follows: 1. Use, when desirable, enough water to soften the plant integuments before percolation, spraying the water on the powdered drug so as to avoid lumping.

2. Allow this water-moistened powder to stand in a closed vessel for a considerable period.

3. Where possible, before packing in the percolator, sprinkle it with enough alcohol to bring the liquids to the composition of the menstruum subsequently employed in percolation.

Among the advantages that may be derived from this process, when feasible, is the fact that a coarsely powdered drug may be more easily exhausted than by the usual method.

The part of the query relating to the use of heat as a preliminary step I will try and consider at a future day.

Note 1.—I do not overlook the fact that they retain from five to fifteen per cent of moisture when air-dried.

Note 2.—In this connection I will remark that green drugs present an obstruction to percolation extraction, in the fact that the large amount of water present in their tissues dilutes a percolate, so that it is impossible to use ordinary maceration or percolation, and without much evaporation prepare a tincture that is representative of any considerable proportion of drug. There is another obstruction in the fact that if the alcohol is very strong it contracts the surfaces to a tough, leather-like substance, which prevents rapid circulation of liquid.

Note 3.—The argument may be made that water is used on account of cheapness. This I do not admit in my own work, and I doubt if others consider it. The cost of the menstruum is not a factor with the manager of a laboratory.

Note 4.—Upon the contrary, with some irregular preparations that I make, I aim to produce a copious precipitation of inert materials at certain stages of the operation, thus, by judicious manipulation, getting rid of burdens that fluid extracts carry to their injury.

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

On Wool Fat, or Lanoleum.*

BY C. S. HALLBERG.

The introduction of the petroleum product, soft paraffin, marked a new era in dermic medication. The discovery of a neutral body of convenient unctuous consistence, indifferent to changes of atmosphere or temperature, not acted upon by chemical agents, was regarded as a very valuable addition to the materia medica. It rendered possible the preparation of ointments not amenable to the reactionary changes which had always been regarded as the *bête noir* of pharmacy. In accord, however, with "the pendular theory," therapeutists soon recognized that, in attempting to evade one source of error by abandoning lard as a vehicle, they had inadvertently fallen into another, greater error—that the very advantages of petrolatum as a substitute for lard as an ointment vehicle constituted its disadvantages for general employment.

Hager first directed attention to the fact that petrolatum was repelled by the perspiratory pores, and that, therefore, it was not a suitable vehicle for ointments designed for endermic or systemic medication. The fascination of the unchangeable petrolatum had, however, become so deep rooted in medical practice that it was very slowly recognized, chiefly through the researches of Shoemaker, that, while petrolatum served admirably for surface medication as a vehicle for zinc oxide, phenol, and similar substances, it should not be used for the salts of iodine or mercury. The oleates then claimed attention, and, with the oleopalmitates introduced by Shoemaker and Lawrence Wolff (1881), were considerably employed, without, however, fulfilling all the requirements of practice. At this period, about 1885, a purified preparation of the so-called wool fat appeared as the result of several investigations dating back from Hartmann and Schulze (1868) to the most recent contribution of Liebreich that year. This so-called wool fat was shown by Liebreich to be the excretion of the perspiratory glands, directly derived from the keratin tissues under the first skin layer, and consisted of a mixture of cholesterins and fat acids. As such it was offensive in odor and color, and regarded as unavailable unless separated from the fat acids, which constituted about 30 per cent of it. The acids being saponifiable by alkalies, their separation was deemed easy, until it was discovered that the soap formed by the addition of alkali and water had the effect of retaining the cholesterins in the emulsion formed by it, although the cholesterins *per se* were not acted upon by alkalies. Treatment with hydrochloric acid, while separating the emulsion, had the effect of again causing the cholesterins and fat acids to coalesce, rendering their separation impossible. The "bright idea" was then hit upon to separate the cholesterins from the liquid soap by centrifugal power, upon the same principle that cream is separated from milk, the comparative lesser gravity of the cholesterin causing it to rise to the top in a layer in the same manner as cream does on milk. This process was a success, and the creamy cholesterin separated and evaporated until its water percentage was established to be within range of that required to yield an ointment of uniform ointment consistence, constituted "lanolin." The therapeutic uses of the article being confirmed, the name of "lanolin" was trade-marked, and the product patented in Germany, the United States, and other countries.

The patent was granted upon:

(1) The combination of wool fat or cholesterins with water.

* Paper read at the annual meeting of the Am. Pharm. Assoc. at San Francisco.

(2) The process for the separation of fat acids and purification, substantially as described in the foregoing.

(3) The sole right to the use of the term "lanolin."

These points if sustained would, of course, give the manufacturer of lanolin the monopoly of all preparations of wool fats for medicinal use.

To this we take exception, substantially for the following reasons:

(1) The so-called wool fat exists *naturally* in combination, and has been used since the time of Herodotus, *always in combination with water.*

[We are compelled, by want of space, to omit the interesting historical proofs given by the author.—ED. AMER. DRUGG.]

(2) The process by the centrifuge is nothing but a *subterfuge.* Purified wool fat with the fat acids serves therapy as well as that without them. The crude wool fat—pure "de gras" imported by the shipload to this country, principally from Marseilles, free from rosin oil, fish oil, and other extraneous fats, selling at about 5 cents per pound—yields an article of as good absorbent power as lanolin when prepared by the following process: 70 parts de gras are freed from grosser impurities by melting and straining. To the melted liquid 20 parts hot water are added, and 1 part potassium permanganate dissolved in 10 parts water, in small quantities at a time, with constant stirring. The mixture should be heated to not exceeding 200° F., and the pot. permanganate solution added in small quantities, waiting with each addition until the ensuing reaction subsides, and when no action further sets in no permanganate solution is added, which may be determined on a watch-glass. The mixture is now thrown into about 400 parts boiling water to which have been added 4 parts hydrochloric acid, and thoroughly agitated, the boiling continued, if possible, by the introduction of steam into the bottom of the mixture. After separating, the water is drawn off and the fat again washed with a similar quantity of boiling water, separated, and the washing once more repeated. Upon cooling of the mixture, the wool fat may be taken out as a wax-like mass. The percentage of water it has absorbed is then determined, and the fat is fused and either evaporated to weigh 100 parts or sufficient water added to it to represent 30 per cent of the entire mass. While yet warm, but upon the point of congealing, the mixture should be triturated until nearly cold. The more thorough the trituration the whiter and firmer of consistence the ointment. With smaller quantities difficulty is here experienced; on a larger scale the ordinary paint mill works very satisfactorily. The product is a body of firm consistence, retained at any ordinary temperature without the addition of wax or paraffin, as has been reported as found in the ordinary patent article, and to that extent detracting from its absorbent power. It has a slightly yellowish-white color, and an odor just perceptible, though not at all disagreeable, of wool. Extended reports from physicians employing it place it at least on a par in absorbent value with lanolin. The process of Gavalowski, extraction of the wool with benzin (deodorized), yields a still whiter product, but the recovery of the benzin from the fat, and especially from the wool, is attended with considerable danger, owing to its inflammable character. The wool freed from fat or sweat by extraction with benzin is of much softer and finer texture than when alkalies have been employed, as in the ordinary wool washing, and commands a higher price. It may be an industry well worthy of investigation upon a large scale. In the extraction of 100 parts wool by this method, about 30 parts fat or sweat are obtained after evaporation of the benzin solvent. The wool, after being dried in the sun, weighs 60 parts; how can the loss of 10 parts be accounted for? was a puzzling question. It was found that the loss of 10 per cent was water combined with the fat extracted with it, and lost in evaporation along with the more volatile solvent benzin! This proves conclusively that the fat exists in nature combined with water in the same proportion for which a patent has been granted. The patent must therefore be *void.*

(3) The term "lanolin" is too descriptive a name to be given as the exclusive property of any individual. Formed from *lana*, sheep, and *oleum*, or *olein*, oil or fat, it is not an arbitrarily selected or fanciful name, but a *legitimate contraction of the most available euphonious expression of scientific derivation.*

We cannot close this sketch without referring to the value of lanoleum as a pharmic vehicle, or rather excipient. It holds the same relation in this respect to solid substances or mixtures as glycerin does to liquids, serving as a "binding medium" to fats of any consistence, and for the incorporation of water-soluble substances with those of fatty character, as in ointments, suppositories, liniments, etc.

Its values as a pharmic agent are alone sufficient to suggest its introduction in the U. S. Pharmacopœia.

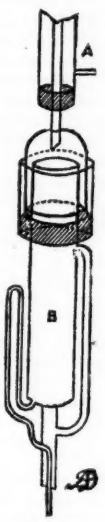
CHICAGO, June 1st, 1889.

Threatened Exhaustion of Caucasian Petroleum.—Recent reports appear to confirm the gradual but decided exhaustion of the Caucasian petroleum wells. It is said that the Rothschilds have succeeded in getting rid of all their investments in this industry.

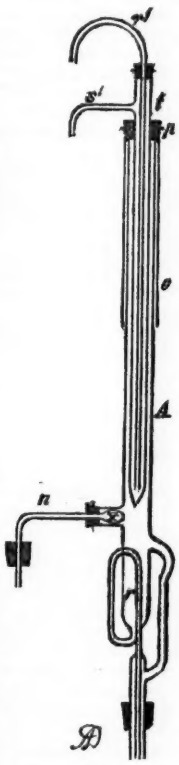
A MODIFIED FORM OF SOXHLET'S EXTRACTOR.

DRS. W. H. KENT and O. GROTHE recommend the form of extractor here illustrated. The extraction tube A is made long enough to receive within it the condenser *t*. This is of the modern form, closed below and terminating in a point, while the water enters it through *r'* and escapes through *s'*. The substance to be extracted is packed into the space *r*. The object of the outer tube *o* is to insure the correct position of the condenser, which should not be in contact with the inner walls of the extractor. When the volatile liquid is to be distilled off, the tube *n*, carrying a spoon, is pushed in until the spoon is directly under the point of the condenser, whereupon the condensed liquid will flow out through *n*.—*J. Am. Chem. Soc.*, 9, 181.

THE ordinary form of Soxhlet's extractor is attached to the condenser by means of a cork. It is, however, frequently difficult to get good corks, some being so hard as to split the upper part of the extractor, while other descriptions are so porous as to permit the water, which generally collects on the condenser and trickles down to the cork, to enter and thus render the ether extremely wet.



Leather's apparatus.



Kent and Grothe's apparatus.

For the idea of substituting a mercury connection for the cork I am indebted to my friend Dr. Vieth, and I am now able, after several months' trial, to give a description of a mercury connection which answers the purpose well. In the accompanying sketch, A is the lower part of the condenser, B is the Soxhlet's extractor. On the lower end of the condenser tube I have had a bell-shaped mouth blown, which is just so wide that it passes readily over the upper end of the extractor, and the end of the condenser tube passes a short way inside the bell mouth, so that the condensed ether drops directly on to the substance which is being extracted. At the upper part of the extractor is a piece of glass tube so wide that it passes readily over the bell mouth of the condenser, and which is fixed at its lower part (that shaded in the drawing) to the extractor by means of cement. An india-rubber ring also makes a good joint in place of cement, but it is generally difficult to get one of the exact thickness. This wide tube, together with the extractor, forms a ring cup into which the bell mouth of the condenser may pass. The ring cup is filled about half full of mercury, and forms, when the extractor is pushed up under the condenser, a perfect joint. The extractor may be held in position by means of a clamp, or it may be readily suspended from the condenser by copper wire.—J. WALTER LEATHER in *J. Soc. Chem. Ind.*

Cleaning Mortars and Graduates.

MR. HANS M. WILDER says: "When I have cleaned my graduates, mortars, etc., thoroughly—at least judging from appearances—I am in the habit of catching the last drop of the final rinsing water on my tongue, and also taking a strong sniff. In this way the last trace of any acrid, bitter, or odorous substance is easily detected, in which case, of course, the washing or rinsing is continued. If substances with marked chemical reactions have been in the graduates or mortars (for instance, salicylic acid, tannin, iron compounds, etc.), I use a few drops of an appropriate reagent in order to make sure of the absence of even traces. When cleaning the scale-pan used in weighing out aniline colors, I always apply at the very last a few drops of alcohol to the apparently thoroughly clean pan, when the merest speck of aniline color will reveal itself instantly.

The idea of keeping separate mortars and utensils for poisons, strongly odorous and bitter substances, is a good one, provided the utensils be marked unmistakably and kept in a separate place. In my store I was in the habit of keeping separate graduates for tinctures of valerian, asafœtida, and spirit of peppermint, which graduates were put behind the respective shelf-bottles on a small tray or a piece of hatter's felt.—*Amer. Jour. of Pharm.*, May, 1889.

What is the Quality of Belladonna Root as Obtained through Reliable Dealers?*

BY W. SIMONSON.

THE material for use in answering this question was obtained through correspondents in Boston, New York, Philadelphia, Cleveland, Columbus, Chicago, St. Louis, Kansas City, San Francisco, and Cincinnati.

Of the specimens, as received, about 8 ounces were ground to number 50 powder, well bulked, and 40 to 50 Gm. powdered in a mortar until less than 1 Gm. failed to pass a number 100 sieve. After well mixing, the siftings, 10 Gm., tightly packed in a small Soxhlet tube, were extracted for four or five hours, when, having changed the receiving flask, the extraction was continued until 15 to 20 C.c. of percolate, evaporated and the residue taken up by one drop of diluted hydrochloric acid, contained not enough alkaloid to react with test solution of potassio-mercuric iodide The solvent employed is that recommended by Dunstan and Ransom, a mixture of equal volumes of chloroform and absolute alcohol, and the remainder of the assay was conducted as directed by them, except that the percolate was extracted with acidulated water instead of pure water, and that the aqueous solutions of the alkaloids were washed repeatedly with chloroform before making alkaline for withdrawing the alkaloid with fresh chloroform. In ten assays of a good specimen of root (No. 7), seven gave, from 10 Gm., .505 to .512 alkaloids, and in the remaining three the process was varied by drawing the alkaloids from chloroform to acid solution, washing this with two volumes of chloroform, in two portions, making alkaline, and extracting with pure chloroform. These last solutions yielded the alkaloids in crystals, pure white, and giving colorless solutions with 1 C.c. water and 2 C.c. dilute sulphuric acid. The weights were .505, .508, and .503. From this it was assumed that the colored alkaloid is sufficiently pure for weighing, and the weights given below are for such colored residues.

In no instance, when tested with ammoniacal ether, was the powder *completely* exhausted, the additional quantity of alkaloid so obtained showing the previous extraction to have reached 96 to 97%. A specimen of very poor root gave .223 per cent by Squibb's method of assay, carrying the extraction further than he directs, and .220 per cent by the one used for this work; so that the results appended show what would be obtained in liquid preparations of the drug rather than what it contained in fact.

In respect to size and external appearance, the specimens received in the entire state may be separated into three groups, but not sharply divided:

First. Small, 3 to 5 Mm., rarely 7 to 8 Mm., in diameter, very light colored, longitudinal wrinkles shallow; very brittle, fracture short and mealy, seldom compact and horn-like; better specimens mostly split, nearly free from knotty heads and short sections of stems, poorer ones containing these (¼ to ½) and partly or not at all split. [In this and the subsequent paragraphs, we have condensed the author's text.—ED. AM. DR.]

Six samples (1888–1889), containing from 0.220 to 0.365% of alkaloids.

Second. 10 to 15 Mm. in diameter, light brown to brown, longitudinal wrinkles much deeper than in preceding; fracture short, grayish brown to dark brown, mealy or (mostly) resinous and horn-like; knotty heads and stems formed about one-fifth of better specimens, except Nos. 7 and 8, and nearly ¾ of poorest one.

Eight samples (1887–1889), containing from 0.364 to 0.617% of alkaloids.

Third. Diameter 20 to 30 Mm., brown or few light brown, longitudinal wrinkles deep as in the preceding; fracture of roots short, seldom tough and woody; surface rarely mealy, usually resinous and horn-like; large knotty and woody heads, with (few) short portions of stems, formed a large part of all samples except Nos. 15, 19, and 20.

Six samples (1887–1889), containing from 0.310 to 0.776% of alkaloids.

Ground and powdered, sold under label of grinder or of dealer.

Ground.—Eleven samples (1888–1889), containing from 0.290 to 0.750% of alkaloids.

Powders.—Four samples (1888–1889), containing from 0.243 to 0.525% of alkaloids.

Numbers 5, 10, 16, and 19 were collected by Prof. Painter in New York City. Of them he wrote: "These samples I believe to be a fair average of the New York market. Three of the four were obtained direct from the importers, and each was carefully selected as an average sample of a single importation of lots of 500 pounds to 1,000 pounds. The sample from ——— ——— ——— (No. 16) is an average of the stock they had in hand, purchased in this market." Number 5 is sufficiently different from the balance to require mention, inasmuch as it represents a supply that is very widely distributed, and is moderately constant in content of alkaloid. In substance it answers the description given for the first group, is free of stems and tough, knotty parts of the root, all pieces split, making a very light-colored, clean, and attractive sample. But the proportion of alkaloid is only .365 per cent, being much below the value of a prime drug. Of it the importers say: "The belladonna root is an average fair sample of a 1,000-pound lot. We import it direct from a district where belladonna root is chiefly gathered." As nothing is known regarding the conditions of growth and time of collection, no comment can be made upon it or upon any of the specimens.

In respect to size and appearance, most of the samples fall below the pharmacopœial description, but those answering it and appearing to have been taken from more mature and fuller-developed plants contain an average of about .5 per cent alkaloids, and would have exceeded this valuation much if more carefully selected and free from lower portions of stems and woody and knotty parts of the roots.

In view of the variable quality of our supply, an authoritative standard of value in alkaloid, for the lower limit at least, is very desirable.

For their prompt aid in securing material, it remains to acknowledge obligations to Messrs. Painter, Trimble, Patch, Bock, Cook, Mueller, Stahlhuth, Federmann, and Buebler.

CINCINNATI, May 12th, 1889.

* Paper read at the annual meeting of the Amer. Pharm. Assoc. at San Francisco.

Hypophosphorous Acid and Ferrous Solutions.*

BY JOHN DEVINE, OF SAN FRANCISCO.

SOON after the last meeting of the American Pharmaceutical Association at Detroit, Professor Painter, the chairman of the section on Scientific Papers, asked me to prepare an essay for this meeting, and the result of my work, the action of hypophosphorous acid (H_3PO_2) on ferrous solutions, is now submitted.

The experiments were commenced November 18th, 1888.

In order to ascertain the minimum quantity of H_3PO_2 that would act as a preservative agent, ten dozen one-ounce vials were labelled in duplicate, with consecutive numbers from one to sixty.

My reason for having them in duplicate was that they might be placed at different temperatures, one of each number.

The hypophosphorous acid I had being insufficient in quantity, I thought of making some, but wishing to save time I sent to a wholesale drug house to get a fifty-per-cent hypophosphorous acid, but could only obtain one of ten per cent. To make myself certain of the strength, I took the specific gravity, and found it to contain only 5.80 per cent of acid.

As I wished to use a concentrated solution, I carefully evaporated it by a water-bath at 120° F. until a twenty-per-cent acid was obtained.

Of this acid, with a very fine burette, I placed nine minims in each of the vials marked No. 1; eight minims in those marked No. 2; seven minims in No. 3, and graduated so that No. 9 had only one minim of H_3PO_2. [At 70° F. the samples containing from ten to five minims of the twenty-per-cent acid kept perfectly, and at 60° F. all samples containing down to six minims; those below these limits became paler, and the last ones more or less tinged.]

Next I made eighteen ounces of solution of iodide of iron of the same strength, and following the principal directions of the National Formulary, No. 216, page 74.

After filtering the solution and making up for loss, I carefully measured one ounce into each of the eighteen vials containing the H_3PO_2, and corked them while hot.

One part, numbered one to nine, was kept at a temperature of 70° F.; the other part, with corresponding numbers, at a temperature of 60° F.

As this lot was quite successful, I proceeded to make sixteen ounces of a stronger solution. The first lot contained two hundred and ninety-five grains of iodine and ninety grains of iron to each fluidounce. The second solution had four hundred and forty-two grains of iodine and one hundred and thirty-five grains of iron to each fluidounce, or one and one-half times the strength of the first lot.

I followed nearly the same lines as laid down in the National Formulary in its preparation, and when completed measured one ounce into each of sixteen vials numbered, in duplicate, ten to seventeen, inclusive, each vial containing a specific quantity of H_3PO_2. [The samples (at 70° F.) containing from ten to four minims of the twenty-per-cent hypophosphorous acid were all in fine condition, of rich green color. A sample with three minims showed a very slight change. At 60° F., the keeping limit was at five minims.]

Being desirous of trying the H_3PO_2 with a weaker solution of ferrous iodide, I then filled sixteen one-ounce vials with a solution of just half the strength of that of the National Formulary, and numbered them, also in duplicate, eighteen to twenty-five, inclusive. [At 70° and 60° F., the samples containing down to seven minims were perfectly preserved. Below seven minims a gradually increasing change occurred.]

* Abstract of a paper read at the annual meeting of the Am. Pharm. Assoc. at San Francisco. (The tables in the original have been omitted, and the results given in brackets.)

As I thought I had made sufficient of the ferrous iodide solutions, I determined to try the effect of various proportions of H_3PO_2 on solutions of ferrous chloride.

The first lot of the ferrous chloride solution was of the same strength as that of the National Formulary, No. 218, page 74.

I placed the H_3PO_2 in the vials, different quantities to each number in duplicate, and followed the directions of the National Formulary in making the solution, except waiting till cold to make up the bulk, which I made up with hot water and filtered, and, while still hot, measured it into the vials, numbered in duplicate from twenty-six to thirty-three inclusive. [At 70° and 60° F., the keeping limit was at three minims.]

As in the case of the ferrous iodide, I made another solution of ferrous chloride, following the same lines in making it as in the preceding lot, but one and a half times stronger than the National Formulary directs. [At both 70° and 60° F., the keeping limit was at two minims.]

I also made a solution of ferrous chloride of half the strength of that of the National Formulary. [In all samples containing down to two minims, the original bright green color had paled considerably; otherwise no change.]

All the solutions of ferrous iodide and ferrous chloride were kept at different temperatures. One lot, numbered consecutively one to forty-nine inclusive, was placed at a temperature of 70° F., the other lot, numbered also one to forty-nine, at a temperature of 60° F.

I have tried on two occasions ferrous solutions of different strengths with various solutions of hypophosphite of potassium—it being the most soluble of the hypophosphite salts—but found it utterly worthless. In fact, instead of retarding, it hastened a change very much.

I have also tried H_3PO_2 as a preservative agent in solutions of morphine and strychnine of different strengths. For contrast, I made solutions of equal strength with chloroform water, camphor water, and distilled water.

It was found that H_3PO_2 is of no value in preserving solutions of morphine and strychnine—distilled water in each case being superior.

The next question is, What becomes of the hypophosphorous acid in the solutions of ferrous iodide and ferrous chloride? It is undoubtedly a powerful agent in preventing oxidation in those solutions; but what rôle does it act? What combinations does it form, or what reasons can be adduced for this acid in preventing oxidation or change? This is a difficult question to answer. 'Tis true we can give equations by chemical formulæ showing reactions. But none of these equations are, to me, satisfactory.

I believe, however, that hypophosphorous acid, by combination, forms an acid ether, called phosphinic acid, which, permeating the solution, prevents molecular change.

Contrary to my expectation, I find that the solutions kept at 70° F. turned out better and brighter than those kept at 60° F.; and, also, that concentrated ferrous solutions kept best—even with a relatively smaller quantity of H_3PO_2.

If they are to be kept for a long time, no doubt highly concentrated ones are best; but, while saying this, I believe that the strength and working formulas in the National Formulary are more practical, and, if prepared with ordinary care, will keep without change for six months or more. If due precaution is used in corking, and the solution kept in small bottles, perhaps a smaller quantity of acid might be used; but, for practical purposes, the formulas of the National Formulary are all that can be desired and cannot well be improved upon.

Notes on Oil Contained in Ground Flaxseed of the Chicago Market.*

BY W. A. PUCKNER.

SOME time since, a sample of ground flaxseed, stated to be East Indian, was given me, with the request that I estimate the amount of fixed oil contained in it. The percentage found, by exhausting with carbon disulphide, was so much larger than the statements of various text-books had led me to expect as to lead me to examine several other samples, the results of which examination are herewith submitted:

The United States Pharmacopœia requires ground flaxseed to yield not less than 25 per cent of fixed oil when extracted with carbon disulphide.

Mr. G. M. Berringer, in the *American Journal of Pharmacy*, June, 1887, states that a sample examined by him yielded 31 per cent, while Mr. Frank X. Moerk (*American Journal of Pharmacy*, December, 1887) obtained 33.5 per cent.

Seven samples of meal, all purchased at retail pharmacies in Chicago, were subjected to the following treatment: 5 Gm. were exhausted in a Soxhlet extraction tube; the flask (Erlenmeyer's) containing the solution of oil in carbon disulphide placed on a water-bath, the CS_2 distilled off at a low temperature, and the flask dried at 100° C. till it ceased to lose, or rather began to gain, in weight. The yield was:

No. 1.	37.53	per cent.
No. 2.	37.40	" "
No. 3.	37.98	" "
No. 4.	37.36	" "
No. 5.	37.88	" "
No. 6.	36.12	" "
No. 7.	37.38	" "

Average 37.37 per cent.

Three possible errors, which might lead to such high results, occurred to me: 1st, impurities in the solvent could, perhaps, extract substances other than fixed oil; 2d, the heat employed in recovering the menstruum by distillation might lead to error; and, 3d, that exposure to the atmosphere, while in the drying oven, would, by oxidation of the oil, materially increase the yield. Five Gm. of No. 2 were, therefore, exhausted with stronger ether, the solution evaporated spontaneously and dried as before—the result was 37.12 per cent. To ascertain whether the heat employed in drying would materially increase the yield by oxidation, the flask, after ceasing to lose weight, was kept at a temperature of 100° C. for about two hours longer (the time usually consumed in drying) and the increase in weight noted—it amounted to less than $\frac{1}{10}$ of 1 per cent.

From these experiments, I conclude that the results obtained with carbon disulphide are fairly correct.

If the subject is considered of sufficient interest or importance, I should be glad if other members of the Association would make similar estimations, thus giving the question a wider scope; or I will undertake to examine any specimens sent to me.

CHICAGO COLLEGE OF PHARMACY.

Morrhuol (Extractum Olei Morrhuæ Alcoholicum).*

BY S. A. M'DONNELL, PH.G., SAN FRANCISCO.

AFTER all the use and abuse of cod-liver oil, this town is now being worked in the interest of a French preparation called morrhuol. To quote from the brochure on the subject—a short *résumé* of the process—which consists in treating the oil with alcohol (what kind?) at 90°, the alcoholic solution so obtained yields, on distillation, an amber-brown, bitter, aromatic liquid, partially crystallizing at the ordinary temperature, which is called morrhuol. The oil thus treated now resembles any ordinary animal oil (in other words, all the curative properties, therefore, must have been extracted by the above simple process). It is elsewhere explained that the light oil, so popular with the great multitude who resort to its use, is very weak in the percentage of the above product. Now, my experience with most remedies of this class has been that the cleverly devised method of bringing about the grand result desired has been more or less a myth—not practical; the special machinery required only being in the hands of the benefactor of his race, whose sole desire is to become the great medium whence all suffering mankind may reap benefit, etc. Nevertheless I concluded to look into the subject a little.

First: The contents of five capsules were placed in a suitable receptacle and some absolute alcohol added thereto. It dissolved one into the other perfectly. I had expected a failure in this respect; but as further experiments led me to the conclusion that it was an alcoholic extract, I proceeded to carry out the process as laid down in the pamphlet. In these experiments, only the light oil was used.

One thousand grains of oil were weighed out, and a like amount of absolute alcohol, both placed in a very strong twenty-ounce bottle, the cork secured tightly, the bottle placed in a water-bath, which was maintained at a temperature of about 90°, at intervals of several days. The contents were then removed, and, after standing long enough for complete separation, the alcoholic solution was decanted, and the last portions of the same removed by means of a pipette. After allowing the alcoholic solution to stand awhile, one hundred grains of it were weighed out and allowed to evaporate spontaneously (free from dust). The extract weighed three and one-half grains, equal to 3.5%.

The oil residue was then placed in a water-bath—as it smelled strongly of alcohol—and heated to get rid of the alcohol; but such heat was only successful in that respect, as the odor and taste of cod-liver oil were still present, which would indicate that the process of distillation (as recommended) would not remove *all* the odor from the oil, although the alcoholic extract was richly charged with it. However, the assertions made regarding the process, as laid down in the paper, for preparing morrhuol, are tolerably well borne out; but as to the therapeutic value of it I can say nothing. And, furthermore, as the preparation is not a difficult one to make, and on a large scale

* Paper read at the annual meeting of the Am. Pharm. Assoc, at San Francisco.

* Paper read at the annual meeting of the Am. Pharm. Assoc. at San Francisco.

could be furnished (as the same alcohol could be used over and over again) at a reasonable price, would it not be well to give countenance to some such preparation as *Extractum Olei Morrhuæ Alcoholicum*, with a view of getting out of it anything there might be in it, from a medical standpoint? For should it possess the merit claimed for it, the smallness of the dose would be a very strong recommendation in its favor.

The Behavior of Some New Remedies.

BY S. A. M'DONNELL, PH.G.

In this paper, of several new remedies (so called), an effort was put forth to ascertain if any very prominent behavior would result between them and some of the more common acids of the shop, as a means of identification under adverse circumstances.

REACTION OF SOME NEW REMEDIES (SO CALLED).

	Sulphonal,	Phenacetin,	Acetanilid	Salol,	Antipyrine,
H_2SO_4	no change.	no change.	no change.	no change.	no change.
HNO_3	" "	Lemon color, developing to an orange color.	" "	" "	Pale amber color, streaked with red.
Acid Nitro-Hydrochlor.	" "	Lemon color.	" "	" "	Amber color, yellowish streaked.
HCl	" "	no change.	" "	" "	no change.
$HC_2H_3O_2$ Glacial.	" "	" "	" "	" "	" "
H_3PO_4 concd.	" "	" "	" "	" "	" "
Fe_2Cl_6 tinct.	" "	" "	" "	" "	Blood red color.
H_2SO_4 dilute heat and solut. K_2CrO_4 CrO_3.	" "	Color darkened a little.	" "	color darkened a little.	H_2SO_4 dilute and heat with crystal K_2CrO_4 CrO_3, color darkened some.

From which it will be seen that only two of the things show any particular change. Phenacetin and nitric acid show a reaction; and antipyrine and tinct. iron give a decided change, the former a lemon color and the latter a blood-red color. One grain of phenacetin in half a fluidrachm of water and five drops HNO_3 added (in a slender test tube), and heated to a boiling point, turns yellow (a portion of the phenacetin forming a globule of a deep orange color), the liquid becoming opaque, which, on cooling, congeals into a solid mass.

One grain of antipyrine in 500 minims of water, and one drop of tr. ferri chlor. (U. S. P.) added thereto, instantly produces a color not unlike that of good sherry wine.

For short:

Nitric acid concd. and phenacetin—yellow color.

Tr. ferri chlor. and antipyrine—blood-red color.

Extemporaneous Preparation of Oleate of Morphine.*

BY S. A. M'DONNELL, PH.G.

Late one evening, some time ago, the following prescription was handed in:

℞ Morph. Oleat. 10%..... ℥ i.

Sig. Use as directed.

Dr. —— ——

with the remark, "Can you put this up?"

The party was answered: "Certainly; kindly be seated for a few moments." I soon realized I had none of such strength on hand. It was not expedient to send out for it, so nothing for it but to try and make it. 450 grains of oleic acid were weighed out, and about 53 grains of morph. sulph. (no alkaloid in stock)—the excess over fifty grains to allow for the difference between alkaloid and salt in the amount of water of crystallization. The acid and morphine were placed on a water-bath and heated; of course (unlike quin. sulph.), none apparently dissolved. So recourse was had to the *ammonia bottle*, out of which a few drops at a time were added at frequent intervals, with constant stirring, until a clear solution resulted. This being rapidly cooled and no sediment appearing, so was dispensed, and, I presume, gave entire satisfaction, as *Hail Columbia*, electrically applied, would have followed a failure to *fill* the bill. I have since experimented with this method of preparing oleate of morphine, and can offer the following as yielding a very satisfactory product. For a 10% solution:

℞ Acidi Oleici..... .....gr. 450.
Morphinæ Sulphatis..... " 53.

Mix, place on a water-bath, apply heat, and add gradually aq. ammon. conc., minims 25, stirring constantly until a perfect solution takes place. Time, about ten minutes in all. Some specimens of morph. sulph. may require a few drops more or less ammonia to effect a solution. The heat dissipates any free ammonia, while any possible resulting ammon. sulph. does not seem to show itself, nor is there any indication of the formation of a soap in view of the nature of the combination. The mixture is apparently all that can be desired, and I can recommend the process to any one requiring oleate of morphine, the same not being kept in stock.

*Paper read at the annual meeting of the Am. Pharm. Assoc. at San Francisco.

Commercial Glycerin.

At the recent meeting of the Ohio State Pharmaceutical Association, three papers were presented in reply to one and the same query, viz.:

No. 48. "Examine the different brands and grades of commercial glycerin. To what extent do they meet the requirements of the Pharmacopœia?"

We shall give a brief abstract of the three papers, only referring to the essential portions.

Mr. Ernest S. Ely, of Barnesville, O., examined fourteen samples representing the products of manufacturers in Cincinnati, Baltimore, and Philadelphia. He applied all the pharmacopœial tests, many of them with various modifications intended to increase their sharpness and accuracy, and arrived at the general conclusion that, strictly speaking, none of the samples examined fully met all the requirements of the Pharmacopœia. Even the two purest specimens were found by the author to be a trifle low in specific gravity. The others were found to contain various impurities, though all, or nearly all, of them in very small quantities, due to accident or unavoidable causes, and not likely added by design.

[Among these impurities the author reports to have found traces of glucose, inasmuch as he found that when certain glycerins were tested with Fehling's solution, they gave a faint reaction for this impurity. The quantity thus apparently found amounted to less than 0.25 per cent. We may be permitted to remark that no one is likely to use only one-quarter of one per cent of glucose as an adulterant. And how glucose or any other kind of sugar can accidentally become mixed with glycerin in the factory is incomprehensible to us. In our judgment, the results of the test as carried out by the author must be differently interpreted.—Ed. Am. Drugg.]

Another paper on the same subject was presented by Mr. J. George Spenzer, of Columbus, O. This author examined "glycerin in bottles, in fifty-pound cases, in one-thousand-pound drums, and the crude."

As a general result, it was found that all the samples were free from adulterations. A few were a trifle below the normal specific gravity. Among twenty-eight samples, one was found to contain "very distinct traces" of arsenic, another "distinct traces," another "a trace," four "a faint trace," and three "a very faint trace" of the same impurity, showing that the American glycerin is liable to be affected in this manner the same as the European.

Among other criteria used by the author are the three cardinal tests set forth by E. Ritzert (*Pharm. Zeit.*, 1888, 715), which may be briefly stated as follows:

1. Absolutely pure glycerin is neutral.
2. It is perfectly volatile.
3. It does not reduce ammoniacal solution of nitrate of silver even when hot.

The neutrality is determined by litmus.

The volatility is determined by evaporating one drop of glycerin on a glass slide (as proposed by Hager) over a small flame. The spot on which the glycerin has evaporated should be transparent and present only a very faint ring. If the spot is translucent, or brownish, or black, the glycerin is impure.

The third test (ammoniacal nitrate of silver) is best applied as follows: 1 C.c. of glycerin and 1 C.c. of water of ammonia are heated to boiling, and 5 drops of solution of nitrate of silver added to the boiling liquid: no coloration or precipitate should be produced.

On applying these three tests to twenty-three specimens of glycerin, *all* were found neutral; most were found practically wholly volatile, but none stood the silver test completely, there being in one case a yellow tint produced (without visible reduction, which tint may, however, be due to a faint reduction and suspension of the reduced molecules), while in all other cases there was reduction, slight in eleven cases, and more decided in the remainder.

A third brief paper was submitted by Mr. John J. Buehler, with a table of results, from which it appears that the specimens examined by him, so far as they represented medicinal (colorless) glycerin, fairly came within the requirements of the Pharmacopœia.

The Alkaline Bichloride Treatment of yellow fever, as suggested by Dr. Sternberg, was carried out during the Jacksonville epidemic of 1888, and Dr. Sollace Mitchell reports that it was very effective. The formula finally used was:

Bicarbonate of Sodium .....gr. x.-lx.
Bichloride of Mercury.....gr. $\frac{1}{10}$.
Water..... ℥ lv.

Mix. Give ice-cold every hour during the day, and every two hours during the night.

The bichloride has a very powerful diuretic effect and lessens the albuminuria, while the bicarbonate corrects the acidity of the intestinal contents.

THE ART OF DISPENSING.

[CONTINUED FROM PAGE 106.]

COATING PILLS.

Silvering or *gilding* pills is fortunately less common than it was a few years ago. It doubtless adds something to the appearance of the pills, but unquestionably injures their solubility and therapeutic value. When, however, such a coating is ordered, care should be used to have the mass of firm consistence and to avoid the use of powder in rolling. When the mass is to contain asafœtida, sulphur, or the sulphides, not only should the mass be quite firm, but the pills should be varnished before applying the metal, or the latter will soon become discolored. When tolu is used as a varnish, the surface should be moistened with a dilute solution of potash to render it adhesive; but for most other coatings mucilage may be used to cause the metal to adhere. One drop of gum water will com-

monly serve to give an adhesive surface to a dozen pills, and one leaf of silver will cover six 5-grain pills. The wetter the pills the more silver will be needed, and the finish will not be so good. The silvering is done by placing the pills, properly moistened, into a boxwood "silverer" (such as shown in the illustration), together with a sufficient amount of silver-leaf in fragments, and shaking them about until they are well coated and the surfaces of the pills are polished by attrition. In the absence of such a box, a round-bottomed ointment jar answers very well, and collodion will sometimes answer in place of tolu as a varnish.

Gelatin.—Of the many forms of pill-coating, gelatin is the preferable one, owing to the perfection of the coating, ease of manipulation, and to the fact that it is not necessary that the pills should be dried before the coating can be applied.

Several formulas have been published for a gelatin solution for this purpose. Hager's formula for extemporaneous coating consists of 2 parts of white gelatin and 5 parts of distilled water, melted with the aid of a water-bath. When material for gelatin coating is to be kept on hand, 10 parts of white gelatin, 25 parts of distilled water, and 6 parts of 90% alcohol are used, and, after mixture by means of a water-bath, allowed to cool, when it forms a jelly. As much as may be needed of this latter mixture can afterwards be melted with a water-bath. To use either of these solutions, the pills are, one by one, stuck upon a pointed wire, and are dipped into the solution with care not to immerse the wire; the wire with the pill is then to be twirled about for a few moments, and then stuck upright into a pin-cushion, vessel of sand, or a piece of bread. When all the pills are coated they may be removed from the wires.

Another and more expeditious way is to put about 30 drops of the warm gelatin solution into a warm porcelain capsule, then add 60 pills, shake them about until they are all moistened, and then distribute them about on waxed paper as quickly as possible, and allow them to dry for a couple of hours. The aid of an assistant in distributing them is desirable in order that it may be done quickly.

Dr. Symes' formula for gelatin coating consists of French sheet gelatin, 4 parts; water, 16 parts; glycerin, 1 part. Melt with the aid of heat. A board is required into which pins have been pressed so that the points project some distance, and it saves time to have another board with depressions, corresponding to the pins, in which the pills to be punctured can be held. The points of the pins, having been greased, are made to puncture the pills, and then, any scum on the coating solution having been removed, the pills are dipped and are then rotated, to insure an even coating, until the coating has set.

Mr. R. H. Dimock advises 6 drachms of Cox's gelatin and 1 drachm of granulated gum arabic to be dissolved in 14 drachms of No. 8 acetic acid with the aid of a water-bath; add 1 ounce of spirit of nitrous ether and 5 minims of oil of gaultheria, and mix. Make the pill mass a little softer than usual; use as little powder as possible in rolling, and when the pipe is nearly long enough for cutting, lay in front of it a thread long enough to reach over the sides of the pill machine, or cut a slit along the pipe and lay the thread in this. Roll to full length and cut the pills, which can then be kept strung on the thread like beads. Holding each end of the thread, shake off any adhering powder, and then dip the pills into the coating solution; twirl the thread so as to throw off any excess of solution, and hang the pills up to dry by pinning the ends of the thread to opposite sides of a box. When the coating is dry the thread can be cut close. Some practice is needed to insure good and speedy results by this method.

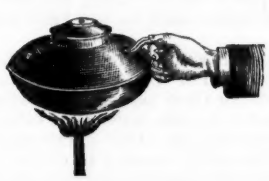
The *Chemist and Druggist* gives the following variation of the method: Into the end of a bottle cork stick a dozen needles so that the points will diverge, and stick a pill on to each point. A mixture for coating is to be made of 4 oz. of French gelatin, 1 oz. of gum acacia, 2 drachms of boric acid, and 40 oz. of water. Macerate the gelatin and acacia in the water for twelve hours. Dissolve with the aid of a water-bath, add the boric acid, and strain through muslin. A sufficient quantity of this stock mixture having been melted, the corkful of pills is to be dipped, withdrawn, and held for a moment to allow excess of coating to form drops. These may be removed by allowing each one to touch the surface of the liquid, after which the cork should be twirled for a few moments and then set aside to allow the coating to harden.

Prof. E. L. Patch says that the following is found by him to be most generally suitable: Best French gold-labelled gelatin, 2½ oz. avoirdupois; distilled water, 7 fl. oz. Macerate until the gelatin softens, dissolve by water-bath, add powdered boric acid, 2 drachms, then slowly add mucilage of acacia (U. S. P., 1880), 2 fl. oz., and strain. Prof. Patch makes the following practical comments:

"Much of the success of the process depends upon having the solution of proper density; the thinner it is the better, providing it gives a complete and firm coating when dry. The warmer the solution the more rapid will be the drying; but judgment must be used in regulating the temperature in each case, for, if too warm, it may soften and destroy the form of the pill, or, in cooling, the gelatin may contract and split or crack. Pills consisting largely of aloes, gum resins, or solid extracts should be made very hard and dipped into a thin, comparatively cool solution. If dipped in too warm a solution the pills will soften, and when the gelatin contracts it will cause the softened mass to protrude from the needle hole.

"Pills containing carbonate of ammonium, citrate of iron, and other scaled salts, valerianates, acetates, alkaline iodides, etc., should also be dipped in cool solution. Glycerin should be avoided as an excipient, owing to its tendency to soften the coating. Glucose forms a good general excipient for pills to be gelatin-coated, and may be used alone with quinine, or with a little powdered extract of licorice for dark pills. A mixture which thickens by keeping should have a little distilled water added from time to time. A pad saturated with petrolatum should be provided, into which the needles may be thrust to grease them before they are inserted into the pills. The needles should be thrust only so far into the pills as to hold them securely, and the pills should be immersed into the coating mixture just far enough to cover them. Excess of coating mixture may be removed by touching the pills to the underheated surface of the cover of the container [or to the surface of the heated mixture]."

Sugar coating may be done extemporaneously, but it is a difficult matter to acquire the necessary skill to rival the work of a confectioner or wholesale manufacturer. One thing should be borne in mind at the outset, which is, that for all work of this kind a very finely powdered sugar, such as is made especially for confectioners' use, is rather essential. The pills should first have their surfaces dry; this is another essential. They may then be put into a tinned-copper bowl (like that shown in the illustration), the inner surface of which has been moistened with syrup



or syrup and gum. The pills are then to be rolled about by rotating the dish, and at the same time the dish is held over a flame so as to warm the contents. Finely powdered sugar is to be dusted on from time to time, and the process continued until a firm, polished coating results.

Another method, recommended by Hager, is as follows: One part of white gelatin is first dissolved in 4 parts of distilled water with the aid of a water-bath. Then a mixture is made of 20 parts of sugar, 10 parts of starch, and 5 parts of tragacanth, and the whole ground to the finest possible powder. About 2 heaped teaspoonfuls of this powder are placed in a box such as is used for silver coating, about 25 drops of the warm gelatin solution are added, and then 50 of the pills to be coated. These pills, having first been dried externally, must be moistened with the gelatin solution just before being placed in the box. The box containing the pills is then to be shaken for about three minutes and the contents emptied upon a sieve. After the powder has been separated, the pills should be again shaken in the box to polish them. If the coating

does not prove of sufficient thickness to render the color of the mass invisible, the operation is to be repeated after the pills have become thoroughly dry and hard. Coloring matter or perfume may be added to the coating powder if desired.

Still another method of sugar coating consists in moistening the pills with a mixture of 1 part of glycerin and 2 parts of alcohol, and then putting them into a coating box containing a very finely powdered mixture of 20 parts of sugar, 3 parts of arrowroot, and 1 part of mastic. Then shake immediately and energetically. Sometimes this method is modified by dissolving 1 or 2 parts of mastic in the alcohol and glycerin.

An extemporaneous and in many cases satisfactory coating of sugar can be given by first coating with white of egg and then rolling about in a suitable vessel with some confectioners' sugar.

Pearl Coating.—An attractive and popular form of coating recently in vogue is produced with powdered soapstone or a mixture of powdered soapstone and sugar. The following points must be observed, viz.: The pills must be hard and dry upon their surface; they must be evenly but not excessively dampened with gum water; and, lastly, they must be thoroughly rotated, first in the powder and afterwards without any free powder, to produce a brilliant surface. By the following method a perfectly finished pearl-coated pill may be turned out in a few minutes: The pills, being fairly hard and rounded, are to be shaken in a pot or chip pill box with sandarach and ether varnish, and then thrown into very finely powdered French chalk contained in another box. Rotate thus for a minute and then separate from the excess of powder with the aid of a sieve. Shake in another chip box with a mixture of equal parts of beaten and strained white of egg, syrup, and water, sufficient to thoroughly wet the pills; then throw them again into an excess of the powder. Shake for another minute and then remove them to a marble slab, where they are to be lightly rotated under a pill finisher, sprinkling on a little more powder, if needed, until a smooth surface is produced. If time permits, they should be dried thoroughly by exposure in an open tray.

Another and somewhat less ready method involves the use of a tinned copper globe, about 5½ inches in diameter. Its halves are fastened together with pins, and two such globes are requisite—one for coating and one for burnishing.

Take 1 drachm each of mucilage of acacia and simple syrup, and add sufficient water to make 1 ounce. Of this pour enough upon the pills to dampen their surface thoroughly (just how much is only known from experience), and after rotating in the coater, in order to distribute the gum mixture thoroughly, add very finely powdered French chalk, and rotate again until the powdered chalk has all been taken up or the pills are thoroughly coated. The pills are then transferred to the burnisher, which may be warmed and slightly coated with white wax, but in this case a third globe will be required for a final polish.

Varnishing may sometimes be resorted to, but is not common in the United States, owing to the facility with which gelatin coating is now done. The residue of tolu syrup dissolved in ether forms a good varnish, 1 oz. of the resinous residue to 3 oz. of the ether being sufficient. Martindale recommends a solution of one part of sandarach in 1 part of absolute alcohol. Hager's formula is 5 parts of powdered mastic and 15 parts of balsam of tolu, to be dissolved in 25 parts of absolute alcohol and 80 parts of ether. The pills are to be placed in a covered pot, and sufficient of either of these solutions to wet the pills is dropped upon them. The pot is then rotated until all the pills have an equal coating. They are best dried on paraffin paper, care being used to see that they do not touch each other.

Keratin derived from horn shavings has been used, on the recommendation of Dr. Unna, of Hamburg, for protecting pills during their passage through the acid secretions of the stomach, this substance being soluble in the alkaline intestinal fluids. Oily excipients alone should be used and a preliminary coating of cacao butter should be applied. The keratin is first dissolved in water of ammonia and evaporated until barely a trace of ammonia remains. Several thin layers of the resulting solution are requisite. The excipient recommended by Dr. Unna consists of charcoal, almond oil, and cacao butter.

A coating which can readily be applied, and which may take the place of the lycopodium, starch powder, or powdered licorice, in which many pharmacists are accustomed to dispense pills, is a great desideratum. The powder is a dirty mess about the table of an invalid, and when carried in the pocket the pill-box is liable to fracture or to become opened and lose its contents, to the discomfiture of the bearer and the injury of clothing. The absence of such powder in packages of manufactured pills is one reason why the latter are popular. As a means for freeing pills from loose powder, a small sieve is convenient.

A contrivance for rapidly counting pills is the invention of A. B. Clariss & Co., of Paris, but something equally simple could readily be made by any one accustomed to the use of tools. The appliance consists of a little scoop with a false bottom perforated with holes which hold a definite number of pills, while the excess roll out through the spout. The pills are discharged by raising the false bottom and allowing the pills to drop into the scoop, whence they may be emptied into the receptacle. Quite recently a metal-capped bottle, similar to those long since in use in Germany for this purpose, has appeared in the drug trade of the United States, and is becoming deservedly popular as a container for dispensing pills.

(To be continued.)

Insect Pests.

THE *Chemist and Druggist* draws attention to the contents of a pamphlet issued by the Agricultural Department on the subject of insect pests, in the following words:

Considering that the remedies for insect pests are drawn from the chemist's stock, it is opportune that we should recall the fact that the Agricultural Department of the Privy Council has had thorough investigations made of the insects injurious to the corn, hop, and fruit crops. The pamphlet dealing with the last-named is, perhaps, the most useful to chemists, and we strongly recommend all in country businesses to acquaint themselves with its contents. The pamphlet may be obtained from Eyre & Spottiswoode, East Harding street, E. C., by post for nine penny stamps. It is not necessary to discuss here the life history of the common insect pests, the purpose of this note being to indicate to our readers what they may prepare for their customers in the nature of remedies. The old-fashioned white hellebore still holds its position as the popular remedy for caterpillar. In some cases it is unquestionably effectual, in others it signally fails. Failure in many cases is due to improper application. Some gardeners, apparently with the idea of making the caterpillars sneeze themselves out of existence, dust the powder on the plants. This is certainly bad for the gardener. Others mix the powder with cold water, and eject the mixture on the plants. This is better, but the best plan is to direct 5 gallons of boiling water to be poured upon a pound of hellebore, and after the infusion cools it may be applied. Hellebore, owing to its poisonous nature, should not be used for soft fruits. Some one has lately spoken highly of the efficacy of gas-tar as a preventive of caterpillar. It is applicable for plants of the cabbage order, for gooseberry and currant bushes—indeed, for all green garden crops. The time to apply preventives is immediately after the caterpillar disappears. At this stage it becomes a chrysalis, which frequently falls from the plant to the ground, there to remain until the ensuing season. For this reason the gas-tar, soot, lime, paraffin oil, or other preventive should be plentifully supplied to the soil, followed by brisk hoeing. It is a pity that before the advent of hot weather those who are pestered with green fly do not make a search for the predictions of the pest. The fly is always heralded by the appearance of a minute "granulation" of white "eggs" situated on the back of the leaf towards the midrib. At this stage a good washing with a solution of a pound of carbolic soft soap in 10 gallons of water is advantageous, and when the nimble insect appears upon the plants a similar preparation, devised by one of our correspondents, is not only useful, but, unlike some remedies, can be put up as a speciality by chemists. It is as follows:

Terebene (Bond's)	2 oz.
Soft Soap	4 "
Methylated Spirit	6 "

Mix together to form a solution.

From 1 to 4 oz. of this insecticide is added to a gallon of water, and the solution used with a syringe or spray producer. For the syringe the weaker solution is sufficient. One of the most efficacious remedies which we know of is a weak solution of crude nicotine. Tobacco infusions and mixtures of tobacco juice with soap and water are commonly used, but they are not at all successful, whereas the nicotine has a marvellously good effect upon rose and fruit trees. Mr. Thomas Christy supplied us with some of the article. It was, apparently, a solution of the alkaloid; and 5 drops, added to a gallon of water, formed a deadly insecticide. As nicotine is one of the most toxic alkaloids, we would suggest that chemists should only sell it in a well-diluted state, so that a few ounces would be required for a gallon of wash. Mr. Whitehead's favorite remedy is a quassia preparation composed of:

Soft Soap	7 lbs.
Quassia	6 "
Water	100 galls.

The whole is allowed to stand together for a night before use. It is the employment of this remedy in the Kent hop gardens which has put up the price of quassia. We prefer to use carbolic soft soap, or any other soft soap which is impregnated with the phenol or creosol products of coal tar. These the green fly and the caterpillar relish as little as they do paraffin, which is sometimes added to the mixture. For retail purposes a combination of 7 pounds of the soft soap with a pound of extract of quassia would be salable. One pound of this mixture would serve for 15 gallons of water. As we are now in the middle of the season for these articles, we trust that the foregoing hints may be turned to good account by those interested.

Properties and Chemical Reactions of Beta-Naphthol.*

Properties.—White lamellæ, melting at 122° C., boiling at 285°–286°; difficultly soluble in cold water; easily in alcohol, ether, chloroform, benzol, glacial acetic acid, concentrated sulphuric acid, and solutions of caustic alkalies. It is soluble in ammonia, forming a colorless, violet-fluorescing liquid, which turns slightly yellow upon warming. On adding peroxide of hydrogen and warming, or allowing it to stand for some time, the solution turns brownish yellow, and, after being supersaturated with hydrochloric acid, acquires a violet color.

On adding ammonia to an aqueous solution of beta-naphthol, and afterwards chlorine water, a yellow-tinted liquid is obtained which assumes a dirty brownish-yellow color on warming. If, however, the chlorine water be first added to the solution of naphthol, a yellowish-white precipitate is produced. This is turned green by addition of ammonia, provided the solution was not too dilute. At the same time a violet precipitate is thrown down which dissolves in ether with violet color, while the remaining aqueous solution has a greenish tint. On evaporating the ethereal solution, a residue remains which is soluble, with blue color, in concentrated sulphuric acid. Addition of glacial acetic acid renders the solution yellowish red.

A *dilute* solution of naphthol is only colored green (without a precipitate) by addition of chlorine water and ammonia. The green color disappears on warming, and the liquid assumes a yellowish-brown color.

Bromine water produces in an aqueous solution of naphthol a white precipitate which is soluble in ammonia, with yellowish green, and in ether, with yellow color. The residue left upon evaporation of the ether is colored dirty green by concentrated sulphuric acid.

Addition of bromine water to a solution of beta-naphthol, previously slightly warmed and mixed with a drop of dilute ammonia, likewise produces a white precipitate.

Solution of chlorinated lime colors a solution of beta-naphthol yellow; on warming, yellow flakes separate. If ammonia had previously been added, warming produces a dark yellow solution. If this is shaken with ether, the latter assumes only a pale yellow tint, and on evaporation leaves a slight yellow residue which is colored brownish-violet, and dissolved by concentrated sulphuric acid.

Addition of chlorinated soda and ammonia imparts a yellowish-brown color to solution of beta-naphthol. After being supersaturated with acid, the solution becomes turbid and violet. If alcohol or glacial acetic acid is now added, a clear liquid of a fine violet color is obtained which possesses a characteristic absorption spectrum.

A solution of beta-naphthol mixed with a drop of aniline is colored yellowish red by chlorinated soda. On supersaturating with acid, the liquid turns more deeply yellow and becomes cloudy. The turbidity disappears upon addition of alcohol or glacial acetic acid.

Addition of ferric chloride to an aqueous or alcoholic solution of beta-naphthol renders the latter faintly green. On warming, a white precipitate is produced which turns yellowish brown by boiling. If the mixture be afterwards shaken with ether, the latter becomes brownish yellow and leaves on evaporation a yellowish-brown residue, forming a brown solution with strong sulphuric acid.

A chip of pine wood moistened with aqueous solution of beta-naphthol, and afterwards with hydrochloric acid, is rapidly colored green when exposed to the sun, and afterwards brownish red. (This test also holds good for alpha-naphthol.)

Concentrated sulphuric acid dissolves beta-naphthol with yellow color. On gently warming, the liquid becomes colorless. Application of more heat causes first a violet color, afterwards reddish brown, and lastly dirty green. (In the case of alpha-naphthol, these tints appear in reversed order.)

If the solution of beta-naphthol in sulphuric acid is heated until it has become colorless, then allowed to become cold, and mixed with a drop of solution of ferric alum, the subsequent application of a gentle heat produces an intense, handsome, bluish-violet tint, which is changed to yellowish green by glacial acetic acid; at the same time, the liquid has a vivid blue fluorescence.

On adding a few drops of nitric acid to an aqueous solution of beta-naphthol, the latter gradually turns green when examined by transmitted, and brownish red by reflected light. On boiling, it becomes turbid and brownish violet, and clear again upon addition of alcohol, with violet color. If the solution is shaken with ether, it also becomes clear, assuming at the same time a handsome violet color, while the ether becomes pale yellow. On evaporating the ether, the residue dissolves in concentrated sulphuric acid, with brownish-red color.

If Eykmann's or Liebermann's reagent is added to a solution of beta-naphthol in concentrated sulphuric acide a brown-red liquid is obtained, which does not change color on addition of glacial acetic acid. Upon addition of water it becomes turbid, but clear again by ammonia, with yellowish-brown color.

On adding to a solution of beta-naphthol in concentrated sulphuric acid a few drops of aqueous solution of glucose, a black, inky liquid results, which, after being copiously diluted with strong sulphuric acid, becomes bluish black. On standing exposed to the air, this tint changes to dark blue. On diluting with much sulphuric acid, it becomes transparently dark blue. Dilution with glacial acetic acid turns it yellowish green with green fluorescence.

On heating a little beta-naphthol with 0.1 to 0.2 Gm. of oxalic acid and a few drops of concentrated sulphuric acid, a colorless mass is obtained which, when treated with water and ammonia, yields a solution having a strong bluish-green fluorescence.

If beta-naphthol is heated together with phthalic anhydride and a few drops of concentrated sulphuric acid to about 150° C., a brown mass is obtained which, upon addition of water, separates a yellowish-white solid soluble in solution of soda to a yellowish-brown green-fluorescent liquid. If much water is added, the solution becomes almost colorless, but has a brilliant, bright-greenish fluorescence.

Alkaline solution of copper (Fehling's) is not affected by beta-naphthol even on boiling.

Ammoniacal solution of nitrate of silver, to which some soda had been added, is not reduced by it in the cold at all, and but little after protracted boiling.

If a little naphthol (alpha or beta) is dissolved in solution of potassa, then a drop of chloroform or an equivalent quantity of chloral hydrate added, and gentle heat is applied, the liquid temporarily assumes the color of Berlin blue. This reaction occurs even if very small amounts of naphthol are present, though the tint is more easily produced and more permanent in the case of beta-naphthol.

An aqueous solution of beta-naphthol is not precipitated by acetate of lead. Subacetate of lead causes a white precipitate disappearing on warming.

Solution of iodide of potassium and iodine, added to an aqueous solution of beta-naphthol, produces, only after heating for some time, a precipitate which is colorless after addition of hyposulphite of sodium, and which is soluble in ether to a colorless liquid (distinction from alpha-naphthol; in this case, the precipitate, after addition of hyposulphite, has a violet color, and is soluble in ether, with bluish-violet tint).

* After G. Vortmann, "Anleitung zur Chem. Analyse organischer Stoffe." 8vo. Leipzig and Wien, 1889, pp. 149.

On Pharmaceutical Assaying.

At the late meeting of the New Jersey Pharmaceutical Association, held at Bridgeton, Mr. August Drescher, of Newark, read a paper on this subject, from which we take the important portions in abstract.

The author confined his discussion to certain drugs and preparations which had come under his particular notice during the past year, in connection with work connected with the State Board of Health. In some of these cases, the U. S. Pharmacopœia does not give any definite "tests," but the law allows the Board of Health to inforce conformity to some other recognized standard, as the U. S. or National Dispensatory, or similar works.

I. Tinctura Opii Camphorata.

First prepare a standard tincture (using strictly standard ingredients) for comparison with any suspected sample through the following tests:

1. *Acidity.*—Dilute 20 C.c. of the sample with 20 C.c. of diluted alcohol, and titrate with $\frac{1}{10}$ normal soda, using phenolphthalein as indicator (Drescher).

A standard paregoric (U. S. Pharmacopœia, 1880) will require 7 to 8.5 C.c. of $\frac{1}{10}$ soda.

A blank experiment may be made with the diluted alcohol, so as to allow for any acidity that might be due to this.

2. *Specific Gravity.*—This is approximately 0.925 to 0.935.

3. *Morphiometric assay* is impracticable.

4. *Meconic Acid.*—Allen's colorimetric method, particularly when applied to the U. S. Pharmacopœia paregoric, yields uncertain results. Drescher recommends the following modification: Evaporate 20 C.c. of the sample, on a water-bath, with 1 Gm. of freshly ignited kaolin to 10 C.c.; filter, dilute filtrate with water [which should be passed through filter.—Ed. Am. Drugg.] to 20 C.c., and add 3 drops of a 10% ferric chloride solution. Compare the tint with that produced in an equal amount of the standard tincture.

5. *Foreign Coloring Matters.*—Caramel, red saunders, and cochineal are often used; cudbear rarely.

Solution of subacetate of lead precipitates the coloring matter of cochineal, saunders, and cudbear. The precipitate may be freed from lead by diluted sulphuric acid, the color taken up by a suitable solvent and further tested.

Caramel is best precipitated by kaolin (freshly ignited), from which it may be shaken out with water when it can be evaporated. Or the tincture may be evaporated directly, and the caramel found in the residue as a black or brown, viscid, sweetish mass, after washing with strong alcohol.

The coloring matter of cochineal and caramel are insoluble in stronger ether. Cudbear is slightly soluble in it, and santal red easily soluble. Caramel is insoluble in strong alcohol.

The coloring matters can be further tested with diluted

sulphuric acid. Cochineal turns yellow; cudbear and saunders do not turn or only *very* gradually. Caramel is not affected, but it is otherwise easily distinguished.

Any color fairly above that of the regular light brown of the standard ought to condemn a suspected article, so that the special examination for coloring matter might be omitted.

6. *Amount of Alcohol.*—Dilute 50 C.c. with 100 C.c. of water, add 3 Gm. of recently ignited kaolin, filter in a closed funnel (to get rid of oil of anise, etc.), distil off 50 C.c., and determine alcohol as usual.

The distillate may contain a trace of camphor, but this is not sufficient to seriously affect the specific gravity (Drescher).

II. Powdered Rhubarb.

1. The *physical properties* ought to be noted and compared with a sample of known purity.

2. *Amount of Extract.*—This should be prepared with alcohol of 45% (by weight). The yield is about 47%, according to Hager. According to Drescher, the yield varies from 37 to 58%.

3. *Ash.*—This amounts to 12 to 14% (Drescher). Sometimes it is stated to be much higher (43% is reported in the "Pharmacographia," second edition, page 500).

4. *Foreign Coloring Matters.*—These are easily detected according to their nature. Aniline colors may be shaken out with benzol or other solvents. Curcuma is easily detected by the method proposed by Maisch and Howie (see National or U. S. Dispensatories).

5. *Chrysophanic Acid* should amount to 2.5% (Drescher; Hager says 3%).

The author gives three methods: Hager's, Schlossberger's, and his own. He states that none of these isolates the whole of the acid, but that they are sufficiently serviceable for practical purposes.

The author's method is as follows:

Mix thoroughly 5 Gm. of finely powdered rhubarb and 1.5 Gm. of tartaric acid; introduce the mixture into a Tollens' extractor, and percolate with 50 C.c. of chloroform at about 65° to 70° C. Evaporate, take up again with chloroform, evaporate again, and weigh the residue as "chrysophanic acid."

III. Jalap.

The officinal process of preparing resin of jalap, which is also used as a method of assay of this drug, has not always given satisfaction in the hands of the author, as the resin sometimes would not separate for days from the water. He modified the process as follows:

Mix 5 Gm. of jalap in No. 50 powder with an equal quantity of fine sand, transfer to a filter, and add gradually 250 C.c. of boiling water, keeping the funnel in a hot-water jacket. After draining and drying the filter, remove the dregs, cut out the impregnated portion of the filter, and digest the latter and the dregs in 150 C.c. of hot alcohol. Filter, wash filter with hot alcohol, evaporate the filtrate to a small bulk, transfer to a small beaker, evaporate to dryness, and weigh.

The resin is then further to be tested as to purity, according to the U. S. Pharm. This authority requires 12% of resin, the German Pharmacopœia 10% as lowest limit. The author of the present paper regards both figures as too high for the jalap of our present market, having found 8.5% as the highest limit.

Estimation of Nitric Acid by Means of Ferrous Sulphate.

M. Bailhache has devised an improvement which permits the old method of Pelouze, of estimating nitrates by means of ferrous salts, to be applied with better results than have been possible heretofore. His principal improvement is the substitution of ferrous sulphate for the chloride.

The apparatus to be used consists of a flask of the capacity of 250 C.c. provided with a rubber stopper having two tubes. One of these is 5 to 6 Cm. (about 2½ inches) long, and drawn out to a point at its upper end. The other, which descends to within about ⅛ inch of the bottom of the flask, is the neck of a stoppered thistle funnel of cylindrical form, of about 40 C.c. capacity. This serves not only for introducing the solution of the nitrate to be assayed, but also to admit slowly, both at the beginning and at the end of the operation, some solution of bicarbonate of sodium, the carbonic acid gas of which expels the air from the apparatus, and at the end drives the last traces of nitric oxide gas from the flask.

To estimate the quantity of non-oxidized ferrous salt, bichromate of potassium is used, with ferridcyanide as indicator.

The following solutions are required:

1. Solution of ferrous sulphate, containing in 1 liter 100 Gm. of crystallized ferrous sulphate ($FeSO_4 . 7H_2O$) and 75 C.c. of concentrated sulphuric acid.

2. Solution of bichromate of potassium, containing 17.85 Gm. of the pure and dry salt in each liter.

3. Standard solution of pure and dry nitrate of sodium, 50 Gm. in 1 liter of pure distilled water.

4. A cold-saturated solution of bicarbonate of sodium.

The bichromate solution oxidizes exactly its own volume of the iron solution. Both of them correspond to 10.192 Gm. of sodium nitrate in 1 liter.

The assay is conducted as follows: Introduce 50 C.c. of the volumetric iron solution into the flask, together with about 25 C.c. of strong sulphuric acid. Agitate, insert the rubber stopper with tubes all adjusted, and then place the flask upon a hot sand-bath large enough to contain, if necessary, 5 or 6 of these flasks.

Close the stop-cock of the funnel and pour into the latter 25 C.c. of the solution of bicarbonate of sodium. Regulate the flow of this carefully, so that it enters the flask only drop by drop. There will be brisk effervescence until the funnel is empty. Before it is all introduced, pour 10 C.c. of the standard solution of nitrate of sodium into the funnel and continue the heat.

At this moment, the greatest care must be bestowed upon the regularity of the ebullition or effervescence, and the regular evolution of nitric oxide, which must neither be allowed to become tumultuous nor to cease altogether.

In proportion as the solution passes in, the contents of the flask become more and more brown. Before the funnel is entirely empty, the stop-cock must be shut off. When the deep brown tint of the liquid has disappeared, 25 C.c. of the solution of sodium bicarbonate are again introduced into the funnel, and the contents of the latter gradually allowed to enter the flask as before. Now remove the flask from the sand-bath, the stop-cock of the funnel being closed. Allow to cool, transfer the contents of the flask to a measuring cylinder, make up the volume with water (including the washings of the flask) to whatever quantity is desired, and titrate with the bichromate solution, using ferridcyanide of potassium as indicator. [This is most conveniently done by placing a number of drops of test-solution of ferridcyanide of potassium upon a plate of glass laid upon a piece of white paper, and transferring at frequent intervals, during the titration, a droplet of the liquid upon one of the drops of the reagent. When no more blue tint is produced, the oxidation is completed.] The number of C.c. of bichromate consumed gives, by a simple calculation, the percentage of nitrogen in the nitrate of sodium [or the quantity of nitric acid].

In a similar manner the operation is performed when a solution of a nitrate of unknown strength is under examination.

The analytical data furnished by the author are quite satisfactory.—After *Compt. Rend.*, vol. 108, 1122.

Aluminium.

The following very interesting account of the new process of manufacturing aluminium is abstracted from a lecture by Sir H. E. Roscoe (after *J. Soc. Chem. Ind.*, 1889, 463):

The production of aluminium previous to 1887 probably did not exceed 10,000 lbs. per annum. The magnitude of the undertaking assumed by the Aluminium Company may be estimated when we learn that they erected works having an annual producing capacity of 100,000 lbs. of aluminium. The works now cover a space of nearly five acres. They are divided into five separate departments, viz., 1st, sodium; 2d, chlorine; 3d, chloride; 4th, aluminium; 5th, foundry, rolling, wire mills, etc.

1. *Manufacture of Sodium* ("Castner Process").

The vessels in which the charges of alkali and reducing material are heated are of egg-shaped pattern, about 18 inches in width at their widest part and about 3 feet high, and are made in two portions, the lower one being actually in the form of a crucible, while the upper one is provided with an upright stem and a protruding hollow arm. This part of the apparatus is known as the cover. In commencing the operation, these covers are raised in the heated furnace through apertures provided in the floor of the heated chamber, and are then fastened in their place by an attachment adjusted to the stem; the hollow arm extends outside the furnace. Directly below each aperture in the bottom of the furnace are situated the hydraulic lifts, attached to the top of which are the platforms upon which are placed the crucibles to be raised into the furnace. Attached to the hydraulic lifts are the usual reversing valves for lowering or raising, and the platform is of such a size as, when raised, completely to fill the bottom aperture of the furnace. The charged crucible, being placed upon the platform, is raised into its position, the edges meeting those of the cover, forming an air-tight joint which prevents the escape of gas and vapor from the vessel during reduction, except by the hollow arm provided for this purpose. The natural expansion of the iron vessels is accommodated by the water pressure in the hydraulic lifts, so that the joints of the cover and crucible are not disturbed until it is intended to lower the lift for the purpose of removing the crucible.

The length of time required for the first operation of reduction and distillation is about two hours. At the end of this time, the crucibles are lowered, taken from the platforms by a large pair of tongs on wheels, carried to a

dumping pit, and thrown on their side. The residue is cleaned out, and the hot pot, being again gripped by the tongs, is taken back to the furnace. On its way, the charge of alkali and reducing material is thrown in. It is again placed on the lift and raised in position against the edges of the cover. The time consumed in making the change is 1½ minutes, and it only requires about seven minutes to draw, empty, recharge, and replace the five crucibles in each furnace. In this manner, the crucibles retain the greater amount of their heat, so that the operation of reduction and distillation now only requires one hour and ten minutes. Each of the four furnaces, of five crucibles each, when in operation, are drawn alternately, so that the process is carried on night and day.

Attached to the protruding hollow arm from the cover are the condensers, which are of a peculiar pattern specially adapted to this process, being quite different from those formerly used. They are about 5 inches in diameter and nearly 3 feet long, and have a small opening in the bottom about 20 inches from the nozzle. The bottom of these condensers is so inclined that the metal condensed from the vapor issuing from the crucible during reduction flows down and out into a small pot placed directly below this opening. The uncondensed gases escape from the condenser at the further end, and burn with the characteristic sodium flame. The condensers are also provided with a small hinged door at the further end, by means of which the workmen from time to time may look in to observe how the distillation is progressing. Previous to drawing the crucibles from the furnace for the purpose of emptying and recharging, the small pots, each containing the distilled metal (on an average about 6 lbs.), are removed, and empty ones substituted.

The temperature of the furnaces is kept at 1,000° C., and the gas and air valves are carefully regulated so as to maintain as even a temperature as possible. A furnace in operation requires 250 lbs. of caustic soda every one hour and ten minutes, and yields in the same time 30 lbs. of sodium and about 240 lbs. of crude carbonate of soda. The residual carbonate, on treatment with lime in the usual manner, yields two-thirds of the original amount of caustic soda operated upon.

2. *Chlorine Manufacture.*

The usual method is employed. The gas is led into four gasometers, each of which is capable of holding 1,000 cubic feet of gas and is completely lined with lead, as are all connecting mains, etc.

3. *Manufacture of Double Chloride of Aluminium and Sodium.*

Twelve large regenerative gas furnaces are used for heating, and in each of these are fixed horizontal fire-clay retorts about 10 feet in length, into which the mixture for making the double chloride is placed. These furnaces have been built in two rows, six on a side, the clear passage-way down the centre of the building, which is about 250 feet long, being 50 feet in width. Above this central passage is the staging carrying the large lead mains for the supply of chlorine coming from the gasometers. Opposite each retort, and attached to the main, are situated the regulating valves, connected with lead and earthenware pipes, for the regulation and passage of the chlorine to each retort. The valves are of peculiar design, and have been so constructed that the chlorine is made to pass through a certain depth of liquid, which not only by opposing a certain pressure allows a known quantity of gas to pass in a given time, but also prevents any return from the retort into the main.

The mixture for the retorts is made by grinding together hydrate of alumina, salt, and charcoal moistened with water, and by means of a pug mill the mass is forced out into solid cylindrical lengths; a workman with a large knife cuts the material into lengths of about 3 inches each. These are then piled on top of the large furnaces to dry. The retorts, when at the proper temperature, are charged by throwing in the balls until quite full; the fronts are then sealed up, and the charge allowed to remain undisturbed for about four hours, during which time the water of the alumina hydrate is completely expelled. At the end of this time, the valves on the chlorine main are opened, and the gas is allowed to pass into the charged retorts. In the rear of each retort, and connected therewith by means of an earthenware pipe, are the condenser boxes, which are built in brick. These boxes are provided with doors, and also with earthenware pipes, connected with a small flue for carrying off the uncondensed vapors to the large chimney. At first the chlorine passed into each retort is all absorbed by the charge, and only carbonic oxide escapes into the open boxes, where it burns. After a certain time, however, dense fumes are evolved, and the boxes are then closed, while the connecting pipe between the box and the small flue serves to carry off the uncondensed vapors to the chimney.

The reaction which takes place is as follows:

$$Al_2O_3 + 2NaCl + 3C + 6Cl = 2AlCl_3NaCl + 3CO.$$

The chlorine is passed in for about seventy-two hours in varying quantity, the boxes at the back being opened from time to time by the workmen to ascertain the progress of the distillation. At the end of the time mentioned, the chlorine valves are closed and the boxes at the back of the furnace are thrown open. The crude double chloride, as distilled from the retorts, condenses in the connecting pipe and trickles down into the boxes, where it solidifies in large, irregular masses. The yield from a bench of five retorts will average from 1,600 to 1,800 lbs., which is not far from the theoretical quantity. After the removal of the crude chloride from the condenser boxes, the retorts are opened at their charging end, and the residue is remixed in certain proportions with fresh material to be used over again. The furnace is immediately recharged and the same operations repeated, so that from each furnace upwards of 3,500 lbs. of chloride are obtained weekly.

4. *Aluminium. Reduction of the Double Chloride by Sodium.*

This is effected in a large reverberatory furnace, having an inclined hearth about 6 feet square, the inclination being towards the front of the furnace, through which are several openings at different heights. The pure chloride is ground together with cryolite in about the proportions of two to one, and is then carried to a staging erected above the reducing furnace. The sodium, in large slabs or blocks, is run through a machine similar to an ordinary tobacco-cutting machine, where it is cut into small thin slices; it is then transferred to the staging above the reducing furnace. Both materials are now thrown into a large revolving drum, where they become thoroughly mixed. The drum being opened and partially turned, the contents drop out into a car on a tramway directly below. The furnace having been raised to the desired temperature, the dampers of the furnace are all closed to prevent the access of air, the heating gas also being shut off. The car is then moved out on the roof of the furnace until it stands directly over the centre of the hearth. The furnace roof is provided with large hoppers, and through these openings the charge is introduced as quickly as possible. The reaction takes place almost immediately, and the whole charge quickly liquefies. At the end of a certain time, the heating gas is again introduced and the charge kept at a moderate temperature for about two hours. At the end of this period, the furnace is tapped by driving a bar through the lower opening, which has previously been stopped with a fire-clay plug, and the liquid metal run out in a silver stream into moulds placed below the opening. From each charge, composed of about 1,200 lbs. of double chloride, 600 lbs. of cryolite, and 350 lbs. of sodium, about 115 to 120 lbs. of aluminium are obtained. The composition of the metal, as shown by analysis, is 99.2 aluminium, 0.3 silicon, and 0.5 iron.

Eight or nine charges are laid on one side, and then melted down in the furnace to make a uniform quality, the liquid metal, after a good stirring, being drawn off into moulds. These large ingots, weighing about 60 lbs. each, are sent to the casting shop, there to be melted and cast into ordinary pigs, or other shapes, as may be required for the making of tubes, sheets, or wire, or else used directly for making alloys of either copper or iron.

A New Sensitive Ink.

A COMMUNICATION has recently been made to the Academy of Sciences by M. Péchard which those on the outlook for a novelty may turn to account at once. It relates to the peculiar physical properties of oxalomolybdic acid, which is an acid obtained by adding molybdic acid almost to saturation to a hot solution of oxalic acid. The liquid becomes syrupy, and on evaporation yields crystals of oxalomolybdic acid, $C_2H_2O_4.MoO_3.H_2O$. The acid is almost totally insoluble in strong nitric acid, but dissolves in cold water, more rapidly on warming, yielding a colorless and strongly acid liquid. It forms well-defined salts. The strange thing about the acid is that when the crystals are dry they may be preserved unchanged either in sunshine or in the dark; but if moist they quickly become colored blue when exposed to the sun's rays. If characters be written on paper with the solution, they remain invisible in a weak light; but when exposed to sunshine they rapidly become visible, turning to a deep indigo color. This only happens when the solution is spread over paper or other surfaces, for the solution itself may be kept unaltered in the bottle for any length of time, except for a trace of blue at the edge of the meniscus, where, by surface action, a little is spread against the interior glass walls. If a sheet of paper be immersed in a saturated solution of the acid, dried in the dark, and then exposed behind an ordinary photographic negative, a very sharp print in blue may be obtained by exposure to sunlight for about ten minutes. The color instantly disappears in contact with water, so that if a piece of this sensitized paper be wholly exposed to sunlight, one may write in white upon the blue ground by using a pen dipped in water. If, however, the paper with its blue markings be exposed to a gentle heat for a few minutes, the blue changes to black, and the characters are then no longer destroyed by water.—*Chem. and Drugg.*

[The original paper of M. Péchard is published in the *Comptes Rendus, etc.*, vol. 108, p. 1052.—ED. AM. DRUGG.]

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EDITORIAL.

THE Society of the German Apothecaries of the City of New York has made a praiseworthy new departure by adopting an amendment to their by-laws, according to which a special committee, in conjunction with the president, is charged with the duty of taking cognizance of any actions at law that may be brought against a member of the Society, and to see that the legal adviser of the Society is duly informed of the matter and the facts in connection therewith. All resulting legal expenses will be borne by the Society, excepting in cases where an accused member has been guilty of a positive dereliction of duty. In such a case, the Society will take no action.

It is notorious that the number of frivolous charges against apothecaries for supposed errors committed in dispensing has increased of late years. No dispensing apothecary is safe from such attacks, which generally are instigated by ignorant, illiterate, or misinformed persons. In some cases, it is true, the frivolity of the charges, nay, even their ridiculousness, is clearly brought out when it comes to a trial—if it comes so far. But what is to recompense the accused party for the vexation, annoyance, loss of reputation and patronage, and expenses? Surely an acquittal, however welcome it may be, is no equivalent. Though it may not deter designing persons hereafter from maliciously prosecuting members of the pharmaceutical profession, it will at least make the burden of the defence —if it be an honest one—lighter to bear by making every member of the Society bear a share of the expense. It is merely a sort of insurance association against unjust and expensive legal prosecutions.

It is probably known to most of our readers that many of the harpies who make these attacks do not expect or want the cases to be brought to a trial, as they are aware of the weakness of their cause. But they expect that the accused will make a handsome compromise, preferring to lose a round sum of money privately than to have his name bandied about in public and have legal expenses besides. It is this class of persons that must be chiefly guarded against. And members of the Society should make it an invariable rule and principle never to listen to any proposition for compromise. They should even go further. When they have successfully gained their case, they should strike back, if at all feasible under the circumstances, and sue the accuser for damages for defamation of character.

OUR attention has been called to the fact that the function or scope of the "Digest of Criticisms on the U. S. Pharmacopœia," published by the Committee of Revision and Publication, is in some quarters misunderstood. Probably the preface had not been carefully read. The "Digest" does not contain any criticisms or recommendations by the members of the Committee of Revision in their official capacity, but it was intended to gather up from the pharmaceutical and medical literature printed since 1883 whatever appeared to have some useful bearing upon the Pharmacopœia, with a view towards its improvement. It does not follow, therefore, that because the "Digest" has scarcely any notes on Oleoresins (for example), the Committee of Revision would not have had something to say about these. But this was not the object. If an attempt had been made to gather the individual comments of the members of the Committee, and to print them in connection with quotations from existing literature, it would have been impossible to publish any portion of the "Digest" previous to the next pharmacopœial convention, and possibly it could not have been published at all within any period at which it could have been of use.

In this connection it may be announced that Part II. of the "Digest" is now passing through the press, and will be sent free of charge to all those persons and societies who received Part I. in the same manner. The number of copies remaining of Part I. is sufficiently large to permit additional copies to be sent to those who may require them, under the rules printed in the inside of the cover.

The Swiss Pharmacopœia Revision Commission assembled for the first time, in Berne, on May 2d last, under the presidency of Professor Schär. The order of the drugs in the new Pharmacopœia will be according to the nature of the parts used, and a large number of new forms of medicines, as fluid extracts, tinctures, etc., will be incorporated. The following are the members of the commission: Three pharmacists, Professors Schär and Weber of Zürich, and Buttin of Lausanne; two medical men, Professors Prévost of Geneva, and Massini of Basle; one chemist, Professor Brunner of Lausanne; and one veterinary surgeon, Professor Berdez of Berne. —*Chem. and Drugg.*

The Molybdate Test for Hypophosphites.

ALTHOUGH it has been stated by Winkler (*Ann. Phys. Chem.*, 111, 443) and others that hypophosphorous acid and hypophosphites give a blue color on precipitation with ammonium molybdate, E. J. Millard has never been able to obtain such a reaction with acid, neutral, or alkaline solutions of the molybdate, or he has obtained at most only a faint coloration after a considerable time. On the other hand, he finds that the addition of a small quantity of sulphurous acid renders the test a most delicate one, and one with which the ordinary nitric acid solution of ammonium molybdate answers well. Phosphates, pyrophosphates, and phosphites do not give the reaction when similarly treated. In pure solutions it is possible to detect 1 part of hypophosphorous acid in 2,000.—*Pharm. Journ.* (3), 19, 585.

A Poisonous Derivative from Chloral and Glucose.

A. HEFFTER reports that when equal parts of pure anhydrous glucose and chloral are heated together in a closed vessel on a water-bath, a chemical combination takes place resulting in the formation of two different compounds.

When the heat has been continued for about two hours, the mass appears homogeneous and dark brown, viscid while hot, and almost as hard as glass when cold. This mass was dissolved in alcohol, and the alcoholic solution diluted with much hot water, which caused the separation of resinous drops. The latter were filtered off and the solution evaporated until all alcohol and remaining free chloral were dissipated. It was then diluted with water, filtered, and set aside to crystallize. The first crop of crystals, after purification, appeared in form of thin lamellæ of a mother-of-pearl lustre, which were tasteless and were found to be free from any poisonous qualities. The mother-liquid, on further evaporation, deposits star-shaped groups of needles which, when purified, are white, but little soluble in water (1 in 154), and have a bitter taste. Their composition is $C_6H_{10}O_5.C_2HCl_3O$, or $C_8H_{11}O_6Cl_3$, there being a loss of one molecule of water [which *may* be derived from the glucose alone, as expressed by the first formula, which the author of the paper does not venture to assume].

This new compound is very poisonous, even in small quantities, and is being studied pharmacologically at present. Further information is promised shortly.—After *Ber. d. D. Chem. Ges.*, 1889, 1050.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,349.—**Ammonin** (O. S. P.).

This is a patented article, prepared "by treating carbonate and silicate of sodium with hydrosulphuric acid, and combining the product with sulphide of ammonium," as we are informed. Dr. Meissner, of Vienna, reports that it is composed of carbonate and silicate of sodium and a considerable quantity of sulphides. It is generally supposed that a pentasulphide of ammonium is used in its manufacture, and that this is treated with steam in presence of soda and lime.

It has been found that the water-soluble portion of ammonin (about one-third of it) is a most efficient cleansing and washing agent of textile fibres, readily dissolving and removing fatty matter and dirt adhering to the fibre. Whether it would be of use for general cleaning purposes in factories we do not know.

No. 2,350.—**Tinctura Ferri Acetatis, Rademacher** (M. A.).

This preparation, which is more often demanded by physicians educated in Germany than by those educated in this country, is supposed to possess special advantages on account of the facility with which it is borne even by delicate stomachs. When well made, it has a fine aromatic odor, somewhat resembling that of Malaga wine, and contains about 1% of iron, calculated as metal.

In giving the method of preparation, we follow Hirsch (Beckurts-Hirsch, "Handbuch d. prakt. Pharmacie").

Dissolve 23 parts of sulphate of iron (ferrous) in 24 parts of distilled water by the aid of heat, and 24 parts of acetate of lead in a like amount of distilled water in the same manner. Add to each solution 48 parts of hot vinegar [or dilute acetic acid] of 6%, mix the two solutions, and add 80 parts of alcohol sp. gr. 0.832. Macerate the mixture in a wide flask for several months until it has acquired a red color, then filter. The sulphate of iron is in excess, but this appears to be intended. The resulting liquid, separated from the sulphate of lead, contains therefore acetate and sulphate of iron, acetic acid, alcohol, and probably some ethers. A certain portion of the iron is gradually separated in form of insoluble compounds, up to a certain but variable limit, beyond which no further change takes place, so that the final product will contain approximately 1% of iron. If the above proportions are used, the final yield amounts to 230 parts, and the sp. gr. of the well-seasoned tincture is 0.982. The long-continued maceration is intended to promote the higher oxidation of the iron which is originally present only as ferrous salt. To facilitate this, the tincture ought to be put into a very wide flask, where it will occupy a layer of little height but wide surface, and the neck be stoppered loosely with cotton, so as to permit a circulation of air. The red color and ethereal odor require several weeks for development.

If the tincture is to be assayed, a portion of it should be concentrated by heat, the whole of the iron oxidized by nitric acid, then diluted, precipitated with an excess of ammonia, and the precipitate washed, dried, ignited, and weighed.

No. 2,351.—**Administration of Tincture of Iron** (J. B.).

We are asked: "What is, in your opinion, the best method to take or administer tincture of iron, so that it will not leave that puckering, astringent taste in the mouth which is so disagreeable to some people?"

If the officinal tincture of iron, or any similar iron preparation of decidedly astringent taste, is to be rendered "tasteless," there are various methods by which this may be brought about, but they all depend upon a more or less complete decomposition of the iron salt. However, this is probably of little importance, since more or less decomposition would have ensued in a dose of the tincture even while being swallowed, or shortly afterwards. Among the methods practised there are two which may be recommended more particularly, viz.:

1. When about to give a dose of the tincture or other iron preparation, dilute it with a little water, pour it into a glass of milk, and at once administer it.

2. Or pour the dose into a glass of Vichy water and administer it. In the latter case there will be some effervescence, even if the water was not charged with gas. The effervescence is due to the fact that the resulting ferric carbonate gives off its carbonic acid. The Vichy water used for this purpose should not be the highly dilute "bar Vichy," which generally contains but traces of the salts characteristic of this celebrated water, but one which approaches in quantity of important constituents the genuine, otherwise there would not be enough alkali carbonate present to completely decompose the iron salt.

No. 2,352.—**Solanine and Potatoes** (Dr. A. D.).

This correspondent asks us to state whether we are aware of any case in which toxic effects have been ascribed to the eating of potatoes. The latter contain the alkaloid solanine, which is quite energetic in doses of about ½ grain.

In reply, we would say that there is no such case on record. The amount of solanine in potatoes is quite small. Young, fresh tubers contain comparatively the largest quantity. According to Hauf, raw, well-developed potatoes, carefully freed from shoots, contained 0.32% of solanine in May (in Germany), and 0.42% in June; in other months less. When potatoes are boiled with water, nearly all the solanine is extracted by the liquid. Potato skins contain more solanine than the mealy part.

No. 2,353.—**Silico-Sulpho-Calcite of Alumina** (M.O.S.).

We confess that we were struck with astonishment when we saw this frightful name. But when we were further informed that it was the name of a new homœopathic remedy recently introduced, we speedily calmed down. Regarding its composition we know nothing, and we do not believe that its originator knows any more about it than we do. He may know what crude or refined chemicals he mixed or brought together with intent to make a new compound, but we defy him to prove it to be a chemical individual. Legitimate materia medica is full enough of mysteries and dark corners even now. It is certainly more than folly to add to it compounds of which no one can give any intelligent account. From a note on the article we were furnished with, we learn that it has been given (!) with favorable results in "housemaid's knee," and that it also "took away a dreadful anal itching, piles, constipation, as if by magic." Further comment is unnecessary.

No. 2,354.—**Oliver's Peptone Test for Bile** (N. Y.).

According to Oliver ("On Bedside Urine Testing," New York, 1885, p. 208), when albuminous urine, acidified by acetic or citric acid, is diluted and run upon jaundiced urine, it will show the presence of bile salts; for, along the plane of contact of the urines, a sharply defined white band or zone of precipitated albumin will instantly appear. In making a practical application of this reaction, Oliver found that an acidified solution of peptone would answer the same purpose as the albuminous urine. He therefore recommends to prepare the test liquid as follows:

Powdered Peptone (Savory & Moore)	gr. 30
Salicylic Acid	gr. 4
Acetic Acid (British Pharmacopœia)	min. 30
Distilled Water	to make fl. oz. 8

Filter several times until the liquid is perfectly transparent.

The author specially directs Savory & Moore's powdered peptone.

Whether this can be replaced by any other brand with equal results we do not know, but it can easily be tried.

In executing the test, the author recommends to run 20 minims of the urine, which contains bile salts in pathological quantity, into 60 minims of the test solution, when an opalescence will appear proportionate to the amount of bile salts present. This opalescence differs from other urinary precipitates produced by an acidified reagent, in this, that it dissolves completely upon adding a drop or two of acetic acid, and in diminishing but not disappearing on boiling. It seems, therefore, that the free acid already present in the reagent is insufficient to prevent opalescence. We have no experience with this test, but propose to try it upon the first specimen of jaundiced urine available.

No. 2,355.—**Guajacol** (B. W.).

This is the most valuable constituent of creosote, and has been recommended by Sahli and Fränkel to be used instead of the more variable creosote. The following formulæ have been mentioned:

℞ Guajacol	gr. 15 ad 30
Alcohol	fl. ʒ ½
Aquæ Destillatæ	fl. ʒ 6

M. Dispense in a dark amber-colored vial.

Dose: A teaspoonful two to three times daily in water.

℞ Guajacol	gr. 112
Tinct. Gentianæ	fl. ʒ 3
Alcohol	fl. ʒ 3
Vini Xerici	q. s. ad fl. ʒ 16

M. Dose: A tablespoonful two to three times daily in water.

No. 2,356.—**Ureated (not "Urate of") Mercury** (P.).

We are asked what the dose of urate of mercury is. Surely our correspondent made an error, or received a wrongly written prescription, for we never heard of urate of mercury, or of any other urate, being given internally as medicine. There is no doubt in our mind that the compound intended was the so-called "ureated mercury," which is another, commercial name to denote the double chloride of mercury and urea ($CON_2H_4.HgCl_2$). This is a salt exceedingly soluble in water, but may be obtained in crystals by dissolving the two ingredients, in molecular proportion, in boiling alcohol. The salt is also called "carbamidated mercury," or "carbamidated bichloride of mercury." It is quoted on some manufacturers' lists,

but seldom kept in stock. The dose would be but little different from that of the bichloride itself. In dilute solution it may also be administered hypodermically.

No. 2,357.—**Effect of Temperature upon Volumetric Solutions** (R. A. R.).

One of our correspondents asks: "At what temperature are the volumetric solutions of the Pharmacopœia prepared, and will not the results of winter and summer determinations widely differ?"

The U. S. Pharm. did not specify any particular temperature for preparing volumetric solutions, as it was assumed that those who would employ them would be familiar with the general principles of the volumetric method. The Pharmacopœia cannot be a text-book for instruction, but only one of application. Treatises on volumetric analysis usually give sufficiently detailed instructions regarding this and other points, so that a knowledge of them may be presupposed.

There is, of course, no agreement among authors, or among practical analysts, as to the precise temperature at which volumetric solutions should be made. Indeed, it would be quite inconvenient and impracticable to follow a prescribed and rigid rule, as it entirely depends upon the temperature prevailing in the place where the solutions have to be used. Mohr's handbook prescribes a temperature of 17.5° C. for preparing certain of the standard solutions, but this involves the necessity of using the solutions at the same temperature, if any definite volume of them is to contain an absolutely exact quantity of the reagent. In the case of many reagents, a moderate variation of temperature, say of 10 or 15 degrees, makes but a slight difference in absolute accuracy, and generally makes no difference at all in *relative* accuracy when a solution is compared with or titrated against another which has been prepared at the same time.

In making standard solutions, either in winter or in summer, it is always best to prepare them in the room in which they are eventually to be used, provided the temperature of the room is fairly equal throughout the year. A temperature of 75° to 85°, or as near as possible to 80°, is probably the most suitable. It must not be forgotten that, although a volumetric solution will increase in volume by heat, yet the glass (flask or burette) in which it is contained will also expand somewhat, and the absolute expansion of the liquid in a burette is, therefore, not fully indicated by its apparent increase in volume.

Solutions which are dependent upon each other, as acid and alkaline solutions, iodine and hyposulphite, nitrate of silver and chloride of sodium, etc., must, of course, always be made and used while they are both at the same temperature, though this may vary somewhat at different times. If they are always kept together in *one* place, and if the solution of the substance which is to be assayed by means of them is also prepared and held at the same temperature as the test solutions, the result will be relatively correct; that is, the volume of the unknown solution which has been found to completely react with the quantity of the standard solution required for the purpose, will contain exactly as much of the substance as the standard solution was capable of indicating *at that temperature*. If the test was made at the temperature at which the standard solution was made, the result gives the *absolute* quantity of the substance revealed by the test liquid.

No. 2,358.—**"Alkaline" and "Alkali"** (J. E. P.).

This correspondent requests us to state what is meant, or rather what should be meant, by the term "*an alkaline citrate.*" He is aware of the fact that this term can have two meanings, viz.: either the citrate of one of the alkalies, or *any* citrate (whether of an alkali or of a heavy metal) having an alkaline reaction to test paper.

We have had several opportunities of communicating our views on this subject, but not in these pages. As it will perhaps interest many others of our readers, and may help to do away with an ambiguity in chemical language, we will briefly state our position.

The adjective "alkaline" has hitherto been used by most writers in two senses, viz.: (1) "belonging to or derived from an alkali," without any reference to any reaction towards chemical test papers; and (2) "possessing the peculiar properties of an alkali, in so far as to produce the characteristic changes in chemical test papers." No doubt many writers have felt the awkwardness of this double meaning, as there are many cases where it would be preferable to leave no doubt in the reader's mind as to which of the two significations is meant. For instance, a writer uses the term "alkaline sulphate," when he may have shortly before have had occasion to use the expression "acid sulphate." No doubt most readers would interpret the former as meaning "the sulphate of an alkali"; but there is, nevertheless, a possibility that a writer may wish to speak of an alkaline sulphate, or citrate, or other salt, as one "possessing an alkaline reaction to test paper." It is very easy to avoid this ambiguity without doing violence to the English language. If the word "alkali" be used in an adjective sense, and the meaning of this be restricted to "belonging to, or derived from, an alkali," and the word "alkaline" be reserved for denoting alkalinity as to test paper, etc., the confusion will be removed. We would speak, therefore, of "alkali salts," "alkali carbonate," "alkali phosphate," etc., meaning *salts, etc., of an alkali*, no matter what their reaction may be. And we would apply the term "alkaline salts," "alkaline sulphate," "alkaline phosphate," etc., to *any salts* (whether of an alkali or metal) having an alkaline reaction.

Information Asked For.

1. What are the physical and chemical differences between vaseline and cosmoline, as at present in the market?

2. Where can Bertholet's Pepsin (a French brand) be procured in this country?

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THE DEBT OF MEDICAL AND SANITARY SCIENCE TO SYNTHETIC CHEMISTRY. By PROF. SAM'L P. SADTLER, PH.D. (Reprinted from the Journal of the Franklin Institute). 8vo, Philadelphia, 1889.

THIS is a concise, clear, and systematically arranged résumé of the organic chemicals which have been introduced into medicine during the past decade. Their chemical constitution and their relation to each other, where such exists, is plainly set forth. Altogether the paper deserves to be put on file for ready reference.

A HANDBOOK OF THERAPEUTICS. By SIDNEY RINGER, M.D., etc. Twelfth Edition. New York: William Wood & Co., 1889. Pp. 524, 8vo.

NUMEROUS works are published on the subject of therapeutics, but none of them have yet succeeded in meeting the needs of a physician engaged in the actual practice of medicine so successfully as this one of Professor Ringer's, and whatever books he may please to have on materia medica, medical botany, pharmacy, or the effects of medicinal substances upon healthy men and animals, Professor Ringer's treatise on the uses of medicines for sick people is something which he can ill dispense with. The addition of new matter has necessitated an increase in the size of the page, so that the present edition is of the usual octavo size, rather than the small octavo with which we are familiar.

THE OLD HOSPITAL, AND OTHER PAPERS. By D.B. ST. JOHN ROOSA, M.D., LL.D. Second Revised and Enlarged Edition of "A Doctor's Suggestions." New York: William Wood & Co., 1889. Pp. 320, 8vo.

THIS is a collection of essays, by a most charming writer, upon topics which chiefly aim at showing the relations between the public and the medical profession. It is beautifully printed upon laid and tinted paper with broad margins; is tastefully bound in an olive-tinted muslin, and has its upper edges gilded. It is a book that may be read with profit by the clergy and laity, and especially by that class which assumes to govern our hospitals, schools, and charitable institutions. Its chapters will furnish ideas for the elaboration of inaugural addresses, after-dinner speeches, and similar occasions, and most agreeable reading for a summer vacation.

DIPHTHERIA: Its Nature and Treatment, by E. C. BILLINGTON, M.D.; and INTUBATION IN CROUP and other Acute and Chronic Forms of Stenosis of the Larynx. by JOSEPH O'DWYER, M.D. New York: William Wood & Co., 1889. Pp. 326, 8vo.

SUCH decided advances have been made of late years in our knowledge of diphtheria that this book has a very open field before it. The author has for some years been identified with the study of the disease, and gives us a work which is far from being a mere compilation while not ignoring the writings of others. The section on intubation is a very acceptable addition. The letterpress is excellent and the illustrations of unusual merit; the one in color, showing varieties of follicular amygdalitis and diphtheria, being particularly good.

HANDBOOK FOR THE HOSPITAL CORPS OF THE UNITED STATES ARMY AND STATE MILITARY FORCES. By CHARLES SMART, Major and Surgeon, U. S. Army. Appointed by the Surgeon-General of the Army. New York: William Wood & Co. Pp. 577, 12mo.

THIS beautiful little pocket manual is announced by its author to be intended to "bring together the various subjects, outside of dispensary work, in which the members of the corps are interested, and present them in such a manner as would render them intelligible to any one who has that dispensary or hospital training which the members of the Hospital Corps are required to have prior to any possibility of promotion."

If any drug-clerk thinks he has too long hours, too small pay, and too numerous responsibilities, we invite him to study the contents of this book and remember that this is required of the military pharmacist in *addition* to his knowledge of pharmacy.

The contents include: The Service of the Post Hospital, Active Service in the Field, General Hospital Service, A Brief Description of the General Anatomy of the Human Body, and, lastly, the Elements of First Aid, Intelligent Nursing, and Ward Supervision. The whole is elegantly bound in green leather, with a brass clasp, and has the chevron of the corps on the front cover.